ProTalk Cv2

INSTRUCTION MANUAL

BE BARNETT ENGINEERING LTD.

INSTRUCTION MANUAL

1272M001
Manual Revision: 9.4 - November 2007

BE BARNETT ENGINEERING LTD.

Contents

Regulatory Notices

CAUTION
The ProTalk Cv2, model B1272D, has been certified by the Federal Communications Commission ("FCC") using the included articulating dual-band dipole antenna. Unauthorized modifications or changes not expressly approved by Barnett Engineering Ltd. could void compliance with regulatory rules, and thereby your authority to use this equipment.

ANTENNA CONSIDERATIONS
The included articulating dual-band dipole antenna installation must provide a separation distance of 20 cm (8") or more between the antenna and all persons to satisfy Maximum Permissible Exposure (MPE) compliance.

INTERFERENCE TO MEDICAL DEVICES
The ProTalk Cv2, model B1272D, contains an embedded cellular telephone module. Do not use this device in health care facilities where cellular phone use is restricted.

Interference to pacemakers, hearing aids, and other medical or personal electronic devices may occur. Consult the manufacturer of those devices to determine if they are adequately shielded from external RF energy. Your physician may be able to assist you in obtaining this information.

POTENTIALLY UNSAFE AREAS
Do not use this device in any area or facility where posted notices restrict the use of cellular phones.

FCC COMPLIANCE
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which the user will be required to correct the interference at his own expense.

INDUSTRY CANADA COMPLIANCE
This Class A digital device complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à norme NMB-003 du Canada.

IDENTIFICATION:

FCC ID:	OVFKWC-M200
Industry Canada ID:	IC:3572A-M200

1. Getting Started

The Cv2 is a very flexible device capable of monitoring discrete or analog inputs and reporting alarm conditions at these inputs. It is also capable of controlling multiple outputs. Before the Cv2 is placed into service it must be programmed for the type of operation you require.

The Cv2 contains an embedded CDMA transceiver. To activate the internal CDMA module, you must do the following:

- If you do not already have a network service account you will need to contact a desired network service representative and setup an account.
- For activation you will need to provide the ESN of the unit, the 'home' location where it will be installed as well as a billing address and contact name.
- Your network service representative will provide a 10 digit telephone number that you will program into the unit.

This can be done using the PC configuration software or a telephone set connected to the Cv2. To use the programming application install the software according to the instructions in section 4-1, connect the powered Cv2 to the computer with the cable provided then activate the transceiver programming function by selecting Program/Cellphone from the menu. Enter the 10 digit telephone number where shown and press the Store button to transfer the number into the unit.

To program the mobile number with a telephone set, plug the set into the programming port of the powered Cv2 and take the set off-hook. The Cv2 will respond with "Enter Program Code" when you take the set off-hook. Follow this sequence:

You:	enter the digit 9	
Cv2:	"ESN is 067 point 12345678"	(unit speaks ESN)
You:	enter the digits **	(advance to MIN)
Cv2:	"Mobile Number is 800 555 1212	(unit speaks MIN)
You:	enter the digits 800 268 2646 **	(change the MIN)
Cv2:	"Mobile Number is 800 268 2646"	(unit speaks new MIN)
You:	enter the digits **	(accept the new MIN)
	or re-enter the MIN and repeat the process	
Cv2	"Enter Program Code" (unit returns to the main program menu)	
You:	hangup - the number programming is completed	

Read this manual carefully before proceeding with the installation and programming of the Cv2. There are two modes of operation available: Advanced and Basic. In Basic mode multiple Advanced functions are combined into a single Basic function for ease of programming. When the unit is configured for Basic operation, all of the variables that can be set by the PC during a programming session can also be modified remotely by calling the unit with a TouchTone telephone. Advanced mode operation allows full use of all functions in the Cv2 but limits the items that can be remotely modified.

Basic mode eliminates the need to configure the Hardware Inputs, Groups and Points by combining them into a single function called Alarms. Similarly, the outputs are reduced to a

single function called Controls. The number of directories is reduced from 6 to 2 in Basic mode. It is possible to retain the Advanced directory commands even if the overall programming is set for Basic operation.

It is important to establish whether Basic or Advanced programming is suitable for your application. The mode is set by the configuration uploaded from the PC and cannot be altered using the programming phone. It is possible to switch programming modes during the PC programming session. When changing from Basic to Advanced there is no loss of data so it is possible to quickly setup a unit in Basic mode then switch to Advanced to add some extra functions. Keep in mind that remote programming capabilities are very limited in Advanced mode. Changing from Advanced to Basic mode will destroy all of the programming information except the directories which have the option of remaining in Advanced mode.

All of the telephone numbers that are entered into a directory should be carefully checked to ensure that they are valid numbers. After the Cv2 has been programmed, a test should be performed to confirm that these numbers are called correctly. The Cv2 has built-in network protection that will alter the operation of the Cv2 if invalid numbers are called.

To prevent excessive failed calls on the cellular network, the Cv2 has a built-in method for counting unacknowledged calls. This process works by counting the number of unacknowledged calls that have been made and then taking action to alert the user that a large number of failures are taking place. If the problem is not corrected and the Cv2 continues to place failed calls it will eventually stop calling.

Rules for this process are:

The number of unacknowledged calls is counted for each directory; receipt of an acknowledgment resets the counter. A retry on the same number is not counted.

If the counter exceeds 50 a "directory alarm" is created. This alarm is not latched and will be cleared when an acknowledgment is received.

This "directory alarm" appears as a new alarm in all groups causing each group to call out and notify the user that the alarm is present. This alarm is announced before the Site ID by speaking "Directory X Error" where X is the directory that has failed to be acknowledged for at least 50 call out cycles.

If an interrogate code is received, the "Directory X Error" message will be made before any group alarms.

If the total number of unacknowledged calls in all directories exceeds 75, a call will be made to Barnett Engineering with the MIN and ESN of the phone. This information will be used to attempt to locate the owner of the equipment and notify them of the problem condition. At this point the timer used to control the interval between the last call in the directory and when the cycle is restarted at the first number will be set to 4 hours regardless of the program settings.

If the total number of unacknowledged calls exceeds 100, the Cv2 will cease to call out. The Cv2 will still answer incoming calls and reset the counters if an acknowledge code is received.

Each chapter has separate sections for Basic and Advanced operations. Once the mode that you want to operate in has been established, use the applicable section in each chapter.

A comparison or the functions available for each mode is shown in Table 1.

Table 1   Mode Comparison

Function	Advanced Mode	Basic Mode
Input debounce	Independent for each input	Part of Alarms - same setting for all
Input NO/NC	Independent for each input	Part of Alarms - same setting for all
Input type	8 inputs - 1 analog, 4 digital types	8 Alarms - 1 digital type only
Output type	8 outputs - On/Off or timed	8 Controls - 3 On/Off or timed
	4 can be special function	5 always special function
Groups	6 groups each with separate	Not used
	Acknowledge code	Part of Directories
	Interrogate code	Part of Directories
	Short and long timer	Part of Directories - Cycle timer
	Shift control	---
	Group enable	---
	Ack request enable	---
	Auto Ack enable	---
Points	30 points, can be any input/output	Not used
	Using group	---
	Enable	Part of Alarms - same setting for all
	Latched	Part of Alarms - same setting for all
	DTMF tag	---
Alarms	Not used	8 alarms
	---	Using Directory A/B or disabled
	---	NO/NC - same for all Alarms
	---	Momentary or Latched - same for all
Directories	6 directories	2 directories
	Dial	Directories commands can be Basic
	Voice	or Advanced when programming in
	DTMF	the Basic mode. Only phone
	Wait	numbers can be programmed in
	Alert	Basic mode.
	Signal	Acknowledge code
	Answer	Interrogate code
	---	Cycle Timer
General	Rings before answer	Rings before answer
	Call progress enable	Call progress enable
	Access code	Access code
	Temporary Ack time	Temporary Ack time
	Enable Modem code	Enable Modem code
	Security levels	—
	Shift change code	—

2. Operations Overview

The purpose of this chapter is to provide an overview of the Cv2 capabilities. Chapter topics are organized in the same order that you would follow in setting up the system.
For more details on configuring the operation through the programming software, refer to Chapter 3, Configuration.

2.1 Cv2 Capabilities (Advanced mode)

When an alarm occurs, the Cv2 places a call using its built-in cellular phone and announces the alarm condition using stored voice messages. Alarm messages consist of the site ID phrase, the group phrase and the alarm message phrase that are stored at voice programming time. The group phrase is used if the alarms have been grouped to provide different activities for different alarm conditions. The unit can also be called up and interrogated to obtain current alarm conditions and readings.

The Cv2 has eight hardware inputs that can be programmed to accept either digital or analog signals and eight hardware outputs. Inputs can be independently configured to operate in these modes:

digital	monitoring contact closures or voltage levels
watchdog	monitoring for the absence of a periodic event
totalizer	counting events
interval	measuring the time duration of events
analog	measuring 0 to 5 volt signals

Outputs can be set to operate as either on/off controls or as timed controls.

2.1.2 What constitutes an alarm?

Alarm conditions can be defined for digital, watchdog and analog inputs. Totalizers and interval inputs are used for measurement purposes and do not generate alarms. The signal at the input is conditioned by a debounce timer that ensures the level is valid before accepting it.

A digital input has normal and alarm states that can be defined as either when the input is high or low. After the input signal has been qualified by the debounce timer, it can be registered as an alarm when the input is active, or it can be latched to detect a pulsed condition. The voice message for a digital input is programmed to announce the alarm condition that it is monitoring, e.g. "Intrusion Alarm".

Watchdog inputs use a timer that is restarted by changes at the input. If this timer expires because it has not been restarted within the programmed interval, an alarm will register. Like the digital input, the watchdog can be set as either an active-only or latched alarm. The voice message for a watchdog is similar to a digital, e.g. "Tower Strobe Failure".

Analog inputs convert the voltage level to a digital value and perform a comparison against the programmed low and high setpoints. An alarm is present when the measured value is above or below the setpoint. Alarm messages are spoken using the stored phrase with either

"High" or Low" appended depending on which setpoint has been exceeded. The actual reading, including decimal place notation and engineering units, is spoken when the Cv2 is interrogated.

The latching alarm function is also available for analog inputs.

2.1.3 How are alarms processed?

The way in which the Cv2 processes alarms is shown in Figure 1.

The hardware input and output ports are activated in the Points section to become part of the
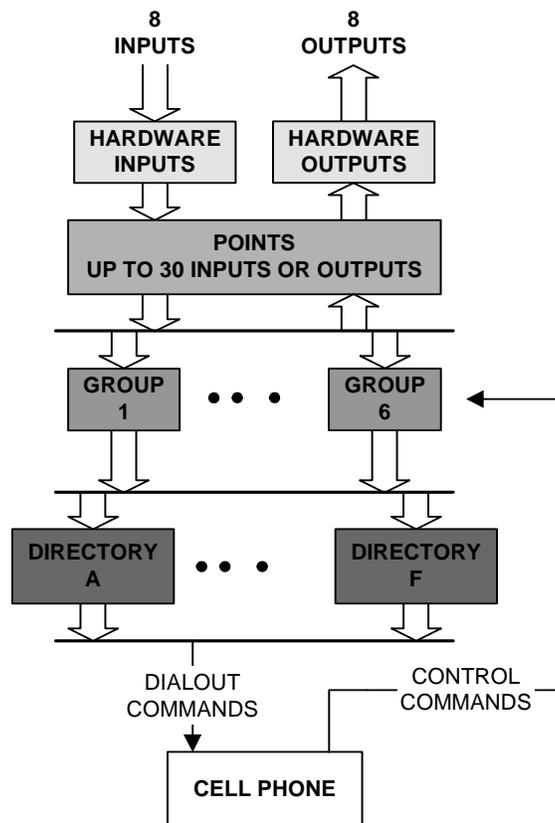
Figure 1
Cv2 Block Diagram - Advanced Mode

monitoring and control process. There are 30 points which can be referenced to any of the I/O ports. This allows an analog input to be used by more than one point and monitored for multiple setpoints, as would be the case where minor and major alarms are required.

If you do not want all of the points to generate the same response when they detect alarms, they can be placed into different groups. Six groups are available, each with independent timers and control codes. When a group detects an alarm condition in one of its assigned points, it executes the sequence of actions found in the current directory. A group can use any of the six directories to perform the call out function, plus the directory selection can be changed by using the shift control feature.

2.1.4 What actions should occur when an alarm is detected?

All alarm conditions will be processed by placing a call on the cellular phone. The called number and the activities that occur with different alarms are determined by entries in the directories. A directory contains the sequence of actions that will occur when a group has an active alarm. Instructions for dialing, speaking, inserting delays and signaling are placed in the directory in the order in which they are to be performed. There are a total of six directories; each can contain a unique sequence of activities that will be performed when alarm conditions exist.

To best describe how a directory controls alarm reporting activities, an example directory programming session follows. For more information on the directory summary and dialog box, refer to Chapter 3. The opening window for a directory displays a summary of the activities that it will perform when an alarm is detected. The directory summary is arranged as lines; each line represents the sequence of events that will take place during one call out. If a Dial command is the first entry on the line, the Cv2 will call the programmed number and then execute the remainder of the commands on that line. After the last command on the line is competed, the call will be terminated. Commands such as Auto Ack and Wait, when used as single line commands, do not initiate a call. For a basic sequence where the Cv2 is to call a phone number and speak the alarm message, the directory line contains the Dial and Voice commands appearing as:

```
1.   [DIAL]2458829 [VOICE]
```

This line will cause the Cv2 to place a call to 245-8829 and then speak the Site ID, Group Name and alarm message, or messages, for all active points.   Unless programmed not to, the Cv2 will append the phrase "Enter Acknowledge Code" at the end of the alarm announcement and wait for the code to be returned. If the code is received, the alarm sequence will be terminated until a new alarm occurs. Failure to receive an Acknowledge Code will advance the sequence of operations to the next line in the directory. If the commands contained in the last directory line have been completed without reception of an Acknowledge Code, the Cv2 waits for the time interval set in the timers before repeating the process by starting over at directory line 1.

During execution of the Voice command, the Cv2 will try to announce the alarm messages three times with a one minute limit for the total announcement duration.

For example, to call four telephone numbers, the directory would appear as:

```
1.   [DIAL]2458829 [VOICE]
2.   [DIAL]2336700 [VOICE]
3.   [DIAL]9842121 [VOICE]
4.   [DIAL]9843316 [VOICE]
```

If you want an alert tone to precede the voice message the directory line would look like this:

```
1.   [DIAL]2458829 [ALERT] [VOICE]
```

The next example shows a sequence that is used to call a numeric paging terminal. After the call is placed there is a four second delay for the paging terminal to respond before the Cv2 sends the number to be displayed on the pager. When calling a paging terminal, it is sometimes useful to allow the called party time to call the Cv2 back and acknowledge the

alarm before the Cv2 advances to the next line in the directory. This can be done by using the Wait command on its own line; the entry below will cause a four minute delay before the next line is executed.

```
1.   [DIAL]2458829 [WAIT]4 [DTMF]4567
2.   [WAIT]240
```

Directory lines can be added, removed, or modified and new lines can be inserted between existing lines.

2.1.5 How do you want to respond to an alarm call?

After the Cv2 has finished speaking the alarm messages, it prompts the called party with the phrase "Enter Acknowledge Code" and then waits five seconds for the code to be returned. If the code is received, it will terminate any further call out activities until a new alarm occurs; otherwise, it will proceed to the next line in the directory. There is a Temporary Acknowledge Time that can be set in the General section that will override the operation of the Acknowledge Code. If the temporary time is set to a value other than Off, and the received Acknowledge Code has the digit # appended to it, the Cv2 will remain in the acknowledged state only for this time interval. After the timer has expired and if the alarm condition still exists, the Cv2 will resume alarm reporting. This feature is used as a safety measure to ensure that an alarm cannot be acknowledged and then left unattended.

Each group has its own Acknowledge Code which only affects points that have been assigned to the group. Other groups with different Acknowledge Codes will continue alarm reporting if they do not receive their own code.

Using the Auto Ack command in a directory will cause the Cv2 to automatically acknowledge any alarms that are in the group using the directory. This feature must also be enabled for that group, since other groups of points may be using the same directory. Auto Ack must be on the last line in a directory since any further commands will never be executed.

Another method of acknowledging the Cv2 is by activating the special function that allows hardware inputs to be used as local acknowledge controls.

2.1.6 What if an alarm is not acknowledged?

When the last line in the directory has been completed without receipt of an Acknowledge Code, a two-stage timer is used to determine when the directory sequence is repeated again. This timer has two sections: a Short Timer which operates for the number set in Short Cycles, and a Long Timer which begins after the Short Timer has completed its cycles. This provides a means of varying the repetition cycle over a period of time.

2.1.7 What do you want the Cv2 to do when you call it?

In addition to reporting alarms, the Cv2 will also answer incoming calls. This allows you to interrogate the unit, operate control outputs and change shifts. You can control the level of security that is presented to incoming calls. With the lowest level, the call will be answered with the Site ID phrase, the phrases for any groups that have alarms, followed by the prompt "Enter Command Code". An Access Code is not required. At the next level of security, the Cv2 will announce the Site ID phrase and then wait ten seconds for the password code before

allowing access to alarm information or other control functions. At the highest level, the call is answered but there are no voice prompts; the caller has ten seconds to enter the Access Code.

Each group of alarms has its own Interrogate Code. When the code is entered, the alarm status for points in that group is spoken. For digital and watchdog points, the stored phrase for that point is spoken. Analog points are spoken with the stored phrase and its status -- high, low or normal -- followed by the reading. For totalizers, the stored phrase is spoken first followed by the current accumulated value. Interval timers respond with the stored phrase and the last captured interval.

Control outputs respond with the stored phrase followed by either 'On' or 'Off' indicating their current state.

The presence of incoming calls is indicated by the ringing sound from the speaker and at one of the outputs if it is selected to show ringing.

2.1.8 Sending remote control commands

Controls can be controlled using the programmed codes. These codes can be sent to the Cv2 either during a reporting sequence or when a call is placed to the unit.

During the alarm reporting sequence, the control codes may be sent after the "Enter Acknowledge Code" prompt is heard. For the next five seconds, the Cv2 will accept Acknowledge, Interrogate or Control codes. With each received code, the command will be performed and a prompt for another command entry will then be spoken. For a remote control output, the status of the output will be spoken after the received code has been executed.

When the unit is called and after the Access Code, if required, has been entered, the prompt to "Enter Command Code" will be issued. In either case, the call will be terminated if a valid code is not received during the ten second window.

2.2 Cv2 Capabilities (Basic mode)

When an alarm occurs, the Cv2 places a call using its built-in cellular phone and announces the alarm condition using stored voice messages. Alarm messages consist of the site ID phrase and the alarm message phrase that are stored at voice programming time. The unit can also be called up and interrogated to obtain current alarm conditions.

The Cv2 has eight alarm inputs that are programmed as conventional digital inputs, set as either high or low to indicate an alarm.

The three user controls can be set to operate as either on/off controls or as timed controls. The other five controls are always set to indicate New Alarm, Any Alarm, Acknowledge Received, Modem Carrier Detect and Ring Out.

2.2.1 What constitutes an alarm?

The signal at the input is conditioned by a debounce timer that ensures the level is valid before accepting it. An alarm has normal and alarm states that can be defined as either when the input is high or low. After the input signal has been qualified by the debounce timer, it can be registered as an alarm when the input is active, or it can be latched to detect a pulsed condition.

2.2.2 How are alarms processed?
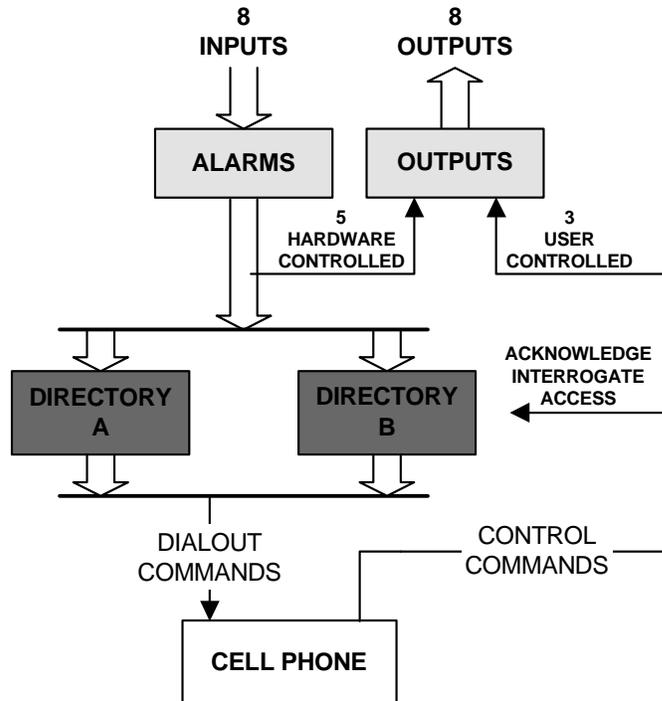
Figure 2 Cv2 Block Diagram - Basic Mode

The way in which the Cv2 processes alarms in Basic mode is shown in Figure 2. The eight inputs can be activated in the Alarms section by selecting them to use either Directory A or Directory B for calling out. Each directory can have a unique list of telephone numbers for calling out as well as its own Acknowledge code, Interrogate code and Cycle timer for repeating the call out sequence. When a directory is edited in the Advanced mode it can have more commands than just dialing and speaking the alarms. The three control outputs are activated in the Control section by selecting On/Off or momentary operation and entering the DTMF control codes. There are also five hardware controlled outputs that are used to indicate New alarm, Any alarm, Ack received, Modem carrier detect and Ring out.

2.2.3 What actions should occur when an alarm is detected?

All alarm conditions will be processed by placing a sequence of calls on the cellular phone until an Acknowledge code is received. The called numbers are determined by entries in the two directories. Each call consists of dialing the phone number followed by a verbal message containing the Site ID phrase then any active alarm phrases.

2.2.4 How do you want to respond to an alarm call?

After the Cv2 has finished speaking the alarm messages, it prompts the called party with the phrase "Enter Acknowledge Code" and then waits five seconds for the code to be returned. If the code is received, it will terminate any further call out activities until a new alarm occurs; otherwise, it will proceed to the next line in the directory. There is a Temporary Acknowledge Time that can be set in the General section that will override the operation of the Acknowledge Code. If the temporary time is set to a value other than Off, and the received Acknowledge Code has the digit # appended to it, the Cv2 will remain in the acknowledged state only for this time interval. After the timer has expired and if the alarm condition still exists, the Cv2 will resume alarm reporting. This feature is used as a safety measure to ensure that an alarm cannot be acknowledged and then left unattended.

Each directory has its own Acknowledge Code which only affects alarms that have been assigned to that directory.

2.2.5 What if an alarm is not acknowledged?

When the last line in the directory has been completed without receipt of an Acknowledge Code, the cycle timer is used to determine how long the Cv2 will wait before the directory sequence is repeated again.

2.2.6 What do you want the Cv2 to do when you call it?

In addition to reporting alarms, the Cv2 will also answer incoming calls. This allows you to interrogate the unit and operate control outputs. When called, the Cv2 will announce the Site ID phrase and then wait ten seconds for the Access Code before allowing access to alarm information or other control functions.

Each directory has its own Interrogate Code. When the code is entered, all active alarms are spoken. Control outputs respond with the stored phrase followed by either 'On' or 'Off' indicating their current state.

The presence of incoming calls is indicated by the ringing sound from the speaker and at output 5.

2.2.7 Sending remote control commands

Controls can be controlled using the programmed codes. These codes can be sent to the Cv2 either during a reporting sequence or when a call is placed to the unit.

During the alarm reporting sequence, the control codes may be sent after the "Enter Acknowledge Code" prompt is heard. For the next five seconds, the Cv2 will accept Acknowledge, Interrogate or Control codes. With each received code, the command will be performed and a prompt for another command entry will then be spoken. For a remote control output, the status of the output will be spoken after the received code has been executed.

When the unit is called and after the Access Code, if required, has been entered, the prompt to "Enter Command Code" will be issued. In either case, the call will be terminated if a valid code is not received during the ten second window.

2.3 Indicators

The Cv2 has four LED indicators to show the operation of the unit and to assist in troubleshooting.

When the Cv2 is initially powered up, the four LEDs will do the following:

- All will turn on for approximately one second.

- Hook will flash on and off for one second then go out.

- Tone will flash on and off for one second then go out.

- Voice will flash on and off for one second then go out.

- Alarm will flash on and off for one second then go out.

- Hook   On power-up, following the initial flashing of each LED, Hook flashes until the Cv2 has found cellular service. Once the unit has logged onto the cellular network, the Hook indicator goes out. Hook also flashes while a call is being placed. After the call has been processed, Hook is on steady until the end of the call when it goes out.

- Tone   Tone blinks once for each DTMF digit that is either received or transmitted.

- Voice   Voice is on when the Cv2 is speaking. On power-up, following the initial flashing of each LED, it will go on continuously for 2 seconds if any section of the stored database, voice or vocabulary memory is corrupt. If this occurs, the configuration should be downloaded into the unit and the voice recordings checked for validity. Voice flashes briefly every second to indicate that the Cv2 is operating correctly.

- Alarm   If an unacknowledged alarm is present, the alarm indicator will flash. When the alarm is acknowledged, Alarm is on steady. When no alarms are present, Alarm is off.

2.4 Troubleshooting

Is there power to the unit?

When power is first applied to the Cv2, it will flash the Hook indicator until it establishes contact with the cellular service. At any other time, the presence of power, and correct operation, are indicated by the brief flashing of the Voice LED every second.

Does the cell phone work?

Use the local call feature to determine if the unit is working properly. If the call cannot be completed, query the cell phone to see if it responds - any parameter can be used here. Query the RSSI (Received Signal Strength Indicator) in the phone to see if there is coverage in the area. The message "error" will be returned if there is no coverage. This can possibly be corrected by improving the antenna system.

Are the inputs connected properly?

For digital inputs that are programmed for standard digital operation, create an alarm condition on the input and confirm that the Alarm LED comes on. Make sure the input is applied long enough for the debounce to time out. If the Alarm indicator does not come on, the problem is not necessarily with the input connection. Check that the input is enabled as a valid point, the associated group is enabled, and the directory is programmed to call out..

For analog inputs (Advanced mode only), interrogate their group to hear the scaled value at the input.

The unit does not dial out.

Check the Alarm LED to confirm that an alarm is present. If this indicator is not flashing, the Cv2 will not call out. For Advanced mode programming, check that the input is enabled as a valid point, the associated group is enabled, and the directory is programmed to call out. For Basic mode programming, check that the alarm has a valid directory selected.

I cannot call into the unit.

If you receive a recording from the telephone company indicating the user is not available, there may be a problem with the installation or you may be calling the wrong number. Use the programming phone to confirm the telephone number in the unit.

3   Installation

The Cv2 can be installed before or after the configuration has been transferred from the PC to the unit. If the Cv2 is configured in the shop before it is installed in the field, all of the programmed parameters and voices will remain unchanged in the unit's non-volatile memory.

3.1   Antenna requirements

The ProTalk Cv2 is supplied with an 8" dual band articulating antenna. This antenna should be mounted vertically for best operation. The antenna installation must provide a separation distance of 20 cm (8") or more between the antenna and all persons to satisfy Maximum Permissible Exposure (MPE) compliance.

The embedded transceiver uses CDMA technology. This is a spread spectrum technology that allows many users to occupy the same time and frequency allocations in a given band/space. It relies on low power transmissions and is able to detect received signals at very low power levels. The addition of higher gain antennas does not usually result in a performance improvement but instead can compromise the performance of the neighboring devices. The best improvements can be made by selecting the proper antenna location and orientation where a vertical orientation outside any metal building or enclosure is best.

3.2   Mounting

The Cv2 is available in two versions: the packaged unit which is housed in an enclosure complete with a battery backed power supply and a programming phone set, or the stand-alone version which is the Cv2 alarm reporter without the above accessories.

3.2.1 Packaged model
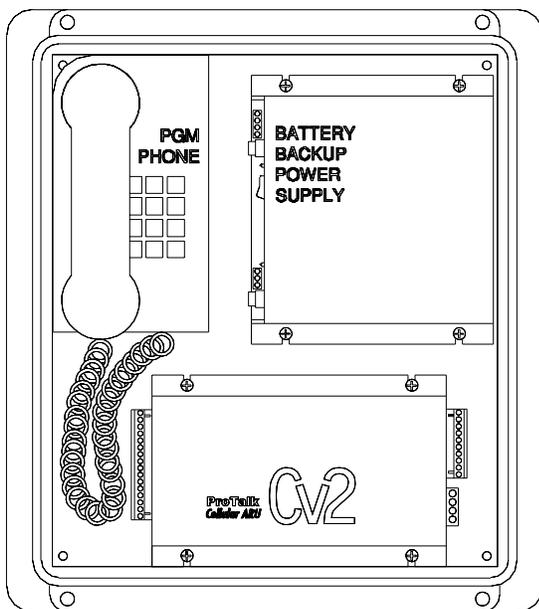
Figure 3   Packaged Cv2

The packaged model should be mounted onto a wall or other vertical surface in a location where the temperature cannot exceed the Cv2 rating.

Before connecting AC power, confirm that the setting of the voltage range switch on the power supply module is set for the correct input, either 110 or 220 VAC.

Connect AC power to the terminal strip on the power supply module. Connect the antenna or coaxial feed line to the remote antenna onto the TNC coaxial jack on the Cv2.

Connect the input and output signal lines between the Cv2 and the equipment that you want to monitor and control. Details of the input and output ports are discussed later in this chapter.

3.2.2 Stand-alone model

The stand-alone Cv2 can be mounted on a flat surface. Make sure that there is enough room around the unit to make connections. The environment should be clean and dry, with an ambient temperature that does not go below -30°C or above +50°C.
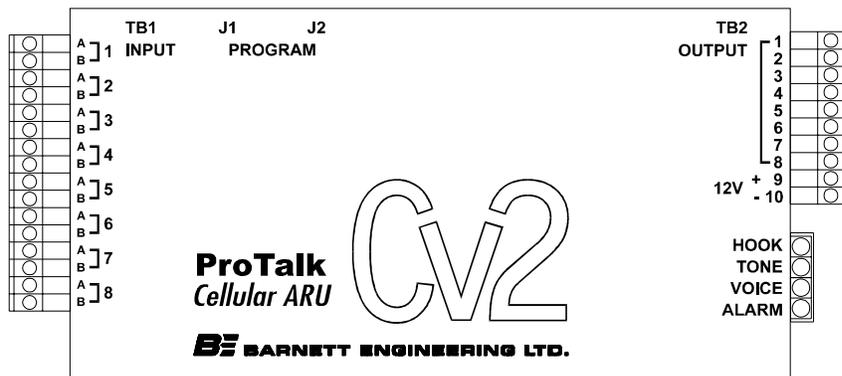
Figure 4   Stand-alone Cv2

Connect a DC power source to the terminals on TB2. The Cv2 requires up to 1.2 Amps to operate; the supply should be sized accordingly. Input power to the unit is protected by a Polyswitch current limiter. If a fault develops in the CV2, this switch will become a high resistance to prevent damage to the equipment or the power supply. Once this switch has been activated, the fault must be removed before it will reset and allow current to pass through to the equipment.

Connect the antenna or coaxial feed line to the remote antenna onto the SMA coaxial jack on the Cv2.

Connect the input and output signal lines between the Cv2 and the equipment that you want to monitor and control. Details of the input and output ports are discussed in the next section.

3.3   Input port connections

The input ports can be connected to a variety of contact or voltage sources for monitoring purposes. Select a wiring configuration that matches your alarm source from one of the following arrangements:

3.3.1 Ground closure alarm signal

For alarm sources that appear as a ground closure, either through a mechanical contact or an open collector driver, the input should be wired according to Figure 5. If the input is normally open and goes to ground during an alarm condition, program the Hardware section for this input as "Normally High". If the reverse is true, set the input to "Normally Low".
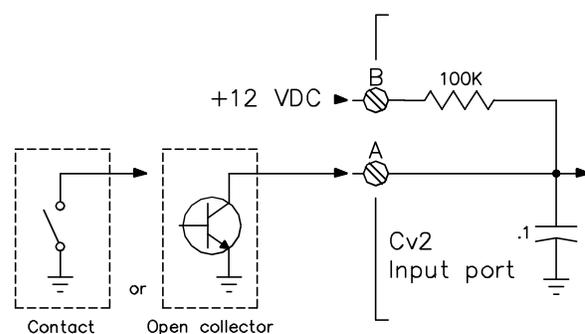
Figure 5   Ground Closure Input Wiring

3.3.2 +12 volt alarm signal

The input will accept an alarm signal that switches between 0 and +12 volts with the wiring arrangement shown in Figure 6.

If the signal switches between +12 volts and an open circuit, as in the case of a relay contact, the 'B' terminal must be connected to ground to ensure that the logic level goes to ground when the voltage is removed.
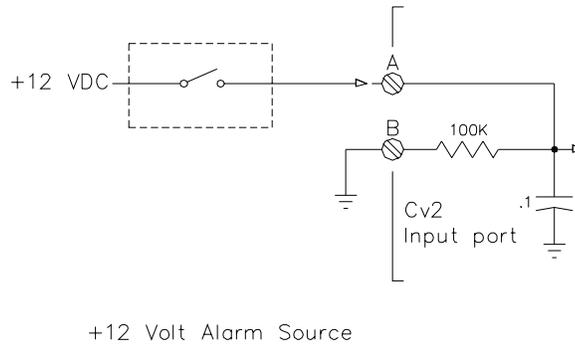
Figure 6   +12 Volt Input Wiring

3.3.3 +5 volt alarm signal

Figure 7 shows how an alarm signal that switches between +5 volts and ground is wired. If the alarm signal does not have a true ground level, terminal 'B' must be connected to ground.
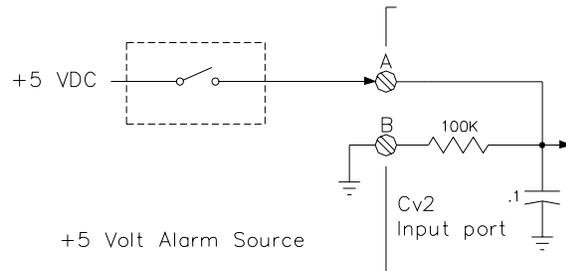
Figure 7   +5 VDC Input Wiring

3.3.4 Analog input (Advanced mode)

For analog signals, either of the wiring configurations shown in Figures 8 and 9 can be used. The connection shown in Figure 8 will provide additional filtering of the signal.
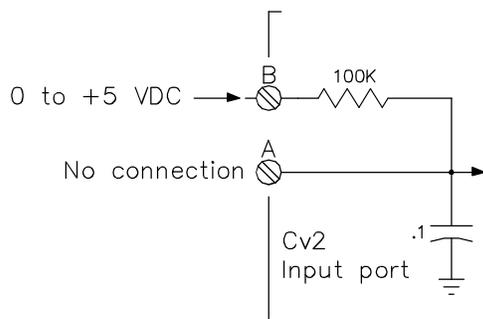
Figure 8   Analog (filtered) Input Wiring
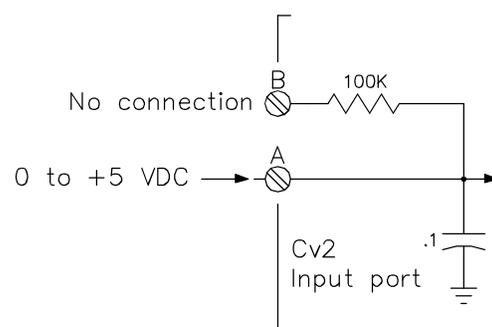
Figure 9   Analog (unfiltered) Input Wiring

3.4 Output port connections

The output ports are open collector drivers that can sink up to 500 mA through a load connected to a voltage of up to +50 VDC. If an inductive load such as a relay is connected to an output, install a protective reverse-biased diode across the load to prevent damage to the output from the inductive flyback voltage. Figure 10 shows the connection for an output used as a relay driver.
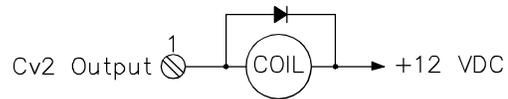
Figure 10   Output Wiring

3.5 Configuration programming connection

When the configuration database is transferred from the PC to the Cv2, a serial communications cable is connected between the COM port of the computer and the serial programming port, J2, on the Cv2. When the cable is attached to the connector on the Cv2, the DTR signal is sensed by the Cv2 and it enters the programming mode. The cable used to connect between the two pieces of equipment is shown in Figure 11. To restore the Cv2 to operation, the cable must be unplugged. The serial programming cable is supplied with the Cv2.

J2 can also be used to program the cellular radio in the Cv2. When the Cv2 detects that the serial port is being used to program the cellular radio, it will automatically route the communications to the radio.
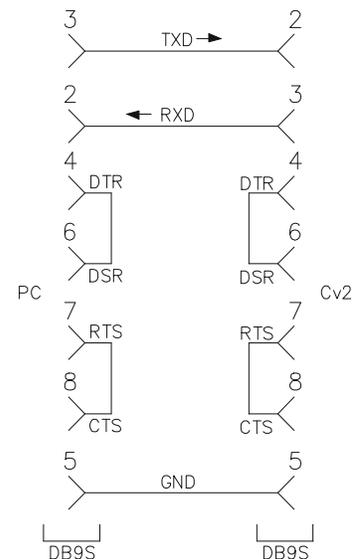
Figure 11   Serial Cable

Figure 12 shows a stand-alone Cv2 installation. The programming PC is present only when a configuration database is to be transferred to or from the Cv2; the programming telephone can be either permanently installed or used only for voice recording. Note that the phone set cannot be used to place outgoing calls. If the Cv2 is to remain operational during a power outage, the DC power provided to the unit must be uninterrupted.

Figure 13 shows a packaged Cv2 installation. The programming PC is present only when a configuration database is to be transferred to or from the Cv2; the programming phone is part of the package and can also be used to place outgoing calls. The built-in power supply contains an 7 AH battery and is capable of running the Cv2 for at least 12 hours during a power outage.

The power supply has a power fail output signal that can be connected to any of the input ports on the Cv2 and programmed as an alarm point.
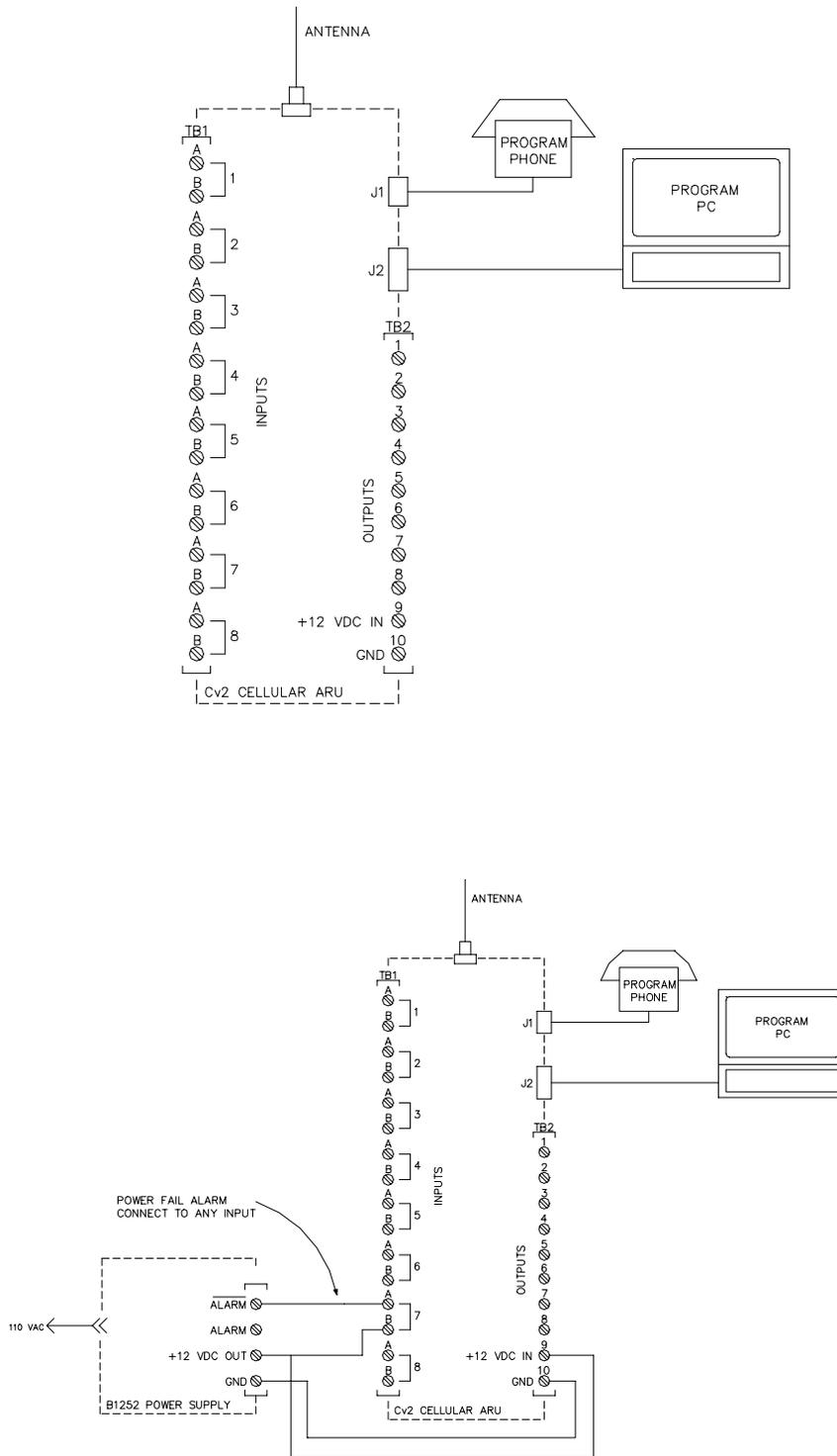
Figure 13 Packaged Cv2

4   Configuration using the PC

This chapter describes how to install the programming software and configure the operation of the Cv2. When the configuration is complete, it can be viewed through the Summary command found on the File pull-down menu. In the summary, Warnings should be checked to ensure that there are no improper settings in the configuration before it is transferred to the Cv2.

4.1 PC requirements

The minimum requirements for the PC used to run the Cv2 programming software are:

- 486 processor
- Windows 95
- 8M RAM
- SVGA screen
- Serial COM port

4.2 Installing the program

The CD supplied with the Cv2 contain the configuration software and the software installation utility. Place the CD into the drive and select the program SETUP.EXE using Run in the windows Start menu. Follow the instructions and the installation program will automatically install the configuration program onto the hard drive.

4.3 Starting the configuration program

To start the program, click on the Cv2 icon that appears in the installed location. The program will load and search for the default startup files:

Cv2.dat   - the configuration database

Cv2.cfg   - the serial port setting

If these files are not found, default files will be created and a warning posted.

4.4 How to access programming functions

At the top of the application are drop-down menus and buttons on the taskbar that launch the various operations in the program. The taskbar buttons duplicate the operations found in the menu. To activate on-line help, press F1 or select the Help menu at the top of the desktop. Context help for the controls is available when dialog boxes are open. Press the Help question mark in the upper right of the dialog box, place the curser with the question mark over the control, then click the left mouse button.

Selection items on the menus and taskbar are different for Advanced and Basic editing.   The menu and button operations for the two modes are summarized in the following section.

4.5 Program Functions - Advanced mode

The menu and taskbar for the advanced mode is shown below:

File Operations

 File Open

If you do not want to edit the default database, use the File Open button to select a different configuration file. This will bring up the standard Windows File Open dialog box where you can open another .dat file.

 File Save As

To save the current configuration under a different name, use the Save As button to bring up the standard Windows Save As dialog box. Enter a new name and save the file. After the file has been saved under a different name, subsequent save operations will store the configuration data with the new name.

 File Save

Use the Save button to save the current configuration database. If the name has not been changed during this session using Save As, the data will be stored as the default Cv2.dat file. If the name has been changed then the file will be saved under the new name.

In addition to the buttons on the taskbar, the File menu also contains the function Clear Database which creates an empty Cv2 configuration.

Summary

 Bring up a printable summary of all settings and warnings.

Change Mode

 Change the mode to Basic.

Hardware

 Inputs - Setup the type of input for each port and select basic hardware settings.

 Outputs - Setup the type of output for each port and select basic hardware settings.

General

 Settings that concern the operation of the entire Cv2 are entered in the General section.

Groups

Each of the six groups can be set to provide different alarm reporting operations for selected points.

Points

In the points section, any of the hardware inputs and outputs can be selected for the Cv2 to use as alarm reporting or remote control functions. There are 30 points available.

Directories

When an alarm is detected, the Cv2 will perform a specific sequence of events determined by the entries in the directory. Six directories are available, providing different actions for different groups.

Programming

The programming section is used to transfer the configuration database between the PC and the Cv2. Recorded voices can also be transferred from the Cv2 and then back.

4.6 Program Functions - Basic mode

The menu and taskbar for the basic mode is shown below:

File Operations - same as shown for the Advanced mode.

Summary - same as shown for the Advanced mode.

Change Mode - same as shown for the Advanced mode.

Alarms

Alarm settings for the 8 inputs are configured here.

Controls

Control output settings are configured here.

General

Settings that concern the operation of the entire Cv2 are entered in the General section.

Programming Programming is the same as for the Advanced mode.

4.7 Configuring the Cv2 - Advanced mode

When configuring the Cv2, the sequence described in the following section is the simplest

way to get the unit operational when in the Advanced mode. If the Cv2 uses any of the special port functions -- Alarm Active, New Alarm, Acknowledge Received, Local Acknowledge or the Totalizer Reset Input -- you must consider the relationship between these functions and the Hardware, Groups and Points sections when configuring the unit.

4.7.1 Hardware section

Start with the Hardware section to establish settings for the input and output ports. Input ports can be configured as Digital, Analog, Watchdog, Totalizer or Interval types. Each port can be independently set to one of these types; an individual port can have only one type assigned. Output ports can be either On/Off or Timed types.

To select an input for configuration click on the Hardware Inputs button to bring up the summary of the input settings. Each of the eight inputs will be shown along with its current type and hardware settings. The input to be edited is highlighted and can be selected by pressing Enter, double-clicking on the line, or selecting the Edit Line function from the menubar. Selecting an input for editing will produce the dialog box for that input type.

After an input or output port has been configured, it can be activated in the Points section for alarm reporting, monitoring or control purposes. Input ports can be changed to one of the other types by selecting from the Change Input Port drop-down list. Changing the input type will force any variables used in the Hardware section to the default value and will remove any points that make use of this port. Output ports can be changed from one type to the other.

Digital Input
    A Digital input represents the basic input type, responding to either high or low signals to indicate the status of the port. Wiring of the port determines if ground closure or voltage signals are being monitored.

    Debounce times are set to qualify the state of the input before it is considered valid. Two debounce time ranges, seconds and minutes, are available. The seconds range has a maximum value of 1638 seconds (27 minutes) with a resolution of 25 msec. For longer debounce times the minutes range should be used. When set to minutes, the debounce timer has a maximum value of 65,535 minutes with a resolution of one minute. For short debounce times, use the seconds timer to avoid the inaccuracy introduced by the one minute resolution.

    Default Debounce time: 0.05 sec

    A Digital input port can also be used to perform special functions in the Cv2. In the Groups section, it can be selected for the Local Acknowledge function, and in the Hardware section it can be set to operate as a Reset Input for a Totalizer.

Watchdog Input
    A Watchdog timer is used to monitor periodic events and will produce an alarm if the event does not occur within the programmed Watchdog interval. Each time an event occurs at the input, the timer is reloaded with the programmed value. When the timer has expired without a refresh event, the alarm is set. Refresh activities can be changes from low to high, changes from high to low, or both.

    Watchdog input types use two timers for their operation: the Debounce timer and the

Watchdog Interval timer. Refer to the preceding Digital input description for details on the Debounce timer. Two Watchdog time ranges, seconds and minutes, are available. The seconds range has a maximum value of 1638 seconds (27 minutes) with a resolution of 25 msec. For longer Watchdog times the minutes range should be used. When set to minutes, the Watchdog timer has a maximum value of 65,535 minutes with a resolution of one minute. For short Watchdog times, use the seconds timer to avoid the inaccuracy introduced by the one minute resolution. When setting the two timers, take into consideration the relationship between the two. The Debounce time can not be greater than the Watchdog Interval; otherwise a constant alarm condition will occur.

Default Watchdog time: 10 min

Interval Input

Interval timers measure the time interval that an input is active, either how long it is high or how long it is low. The input is conditioned by the Debounce timer which is described in the Digital input section. When setting the Debounce timer, consider the anticipated duration of the interval. Since the Cv2 registers a change only after the Debounce time, long debounce settings will affect the accuracy of the measurement.

Totalizer Input

Totalizer inputs measure the number of times that an event has occurred at the input. The event can be a high to low transition, a low to high transition, or both. Before the change is considered valid, it is conditioned by the Debounce timer - described in the Digital input section. Take into consideration the expected time period between events when setting the Debounce timer.

The count in the totalizer can be reset by two methods: by sending the Reset Code entered in the Points section, or by using the Reset Input selection in the Hardware setup.

Analog Input

Setting the input port type to Analog allows measurement of voltages between 0 and +5 volts. As with the other input types, the definition of an analog input is completed in the Points section where the range, setpoints and units are assigned.

An Analog port can be changed to one of the other input types by selecting from the Change Input Port drop-down list. Changing input type will force any variables used in the Hardware section to the default value and will remove any points that make use of this input.

On/Off Output

On/Off outputs operate with two DTMF codes that are set in the Points section. One code turns the output On and the other returns it to the Off state. The output will remain in the last commanded state indefinitely.

To make an On/Off port operational for remote control it must be configured and enabled in the Points section.

Timed Output

Timed outputs are activated by receipt of a single DTMF 'On' code. This code is set in the Points section. When the code is received, the output will activate and will remain in that state until the timer expires or the DTMF 'Off' code is received.

Two timer ranges, seconds and minutes, are available. The seconds range has a maximum value of 1638 seconds (27 minutes) with a resolution of 25 msec. For longer times the minutes range should be used. When set to minutes, the timer has a maximum value of 65,535 minutes with a resolution of one minute. For short times use the seconds timer to avoid the inaccuracy introduced by the one minute resolution.

When the command to turn on the Timed output has been received and executed, the Cv2 will announce the current state of the output port. If the timer value is set to a short interval, it is possible that the output will have returned to the Off state by the time the status is announced.

To make a Timed port operational for remote control it must be configured and enabled in the Points section.

4.7.2 Points section

After the Hardware ports are configured, use the Points section to specify how activities on these ports are processed. There are 30 points available for use as either input or output controls. It is in the Points section that inputs are given the ability to generate alarms and outputs are enabled to perform remote control functions. Each point can be referenced to any of the input or output ports. When a port is selected in Points it will have the characteristics that were set in the Hardware section. If a different type of operation is required for a port, it must be changed in the Hardware section.

Input and output ports that have been defined as a special function in the Group section (Local Ack New alarm, Any alarm or Ack received) or in the General section (Modem carrier detect and Ring out) are not available as general purpose ports.

To access a point for configuration, select the Points button to bring up the summary of the settings. Status of the 30 points will be shown along with a brief description of their settings. Highlight the point to be edited, then select it by pressing Enter, double-clicking on the line, or choosing the Edit Line function from the menubar. Selecting a point will bring up the dialog box for that type.

Depending on the type of point, the contents of the dialog box will vary. There are a number of common settings that appear in all of the point dialog boxes:

Common Settings for Points

I/O Port Selection

If you would like to change the type of input or output, select one of the other available ports. Changing the port will force the point to its default settings and the settings for the current point will be lost.

If a port is being used for one of the special functions, an abbreviated Function Code will also be displayed in the port selection list. These are not available as points.

>ACK<	Local acknowledge input for one or more groups.
>RES<	Reset input for one or more totalizers.
<ALM>	Output used to indicate there is an Alarm Active in one or more groups.
<NEW>	Output used to indicate that there is an unacknowledged, or New Alarm, in one or more groups.
<ACK>	Output used to indicate that an Acknowledge Code has been received for one or more groups.

             <RING>   Output used to indicate that the phone is ringing.

             <CD>   Output used to indicate that the modem is in the connected state.

Default Port Selection: Unused, not included in any reporting activities.

Point Name

The Point Name is a 16-character text field where you can enter a description of the point. This name is used for quick identification in the point summary; otherwise it is not required for operation of the Cv2. Normally the name assigned is the same as the voice message programmed into the Cv2 for this point.

Default Point name: empty text string.

Using Group

Each point is placed into a group, which will determine, through a directory, what actions take place when an alarm occurs. For example, groups could be set up to process alarms specific to security, maintenance and/or operations. Points would then be assigned to the group concerned.

Default group: Group 1.

Enabled

When a point is enabled, alarm activities will be reported and it can be interrogated for its current status. A disabled point does not produce alarms and cannot be interrogated. Changing the enable flag does not alter any of the other settings for this point.

Default Point state: disabled.

Digital and Watchdog Points

Settings for Watchdog points are the same as for Digital points.

Alarm State

Points can be set to register an alarm in two ways: only when the alarm condition is present, or latched when an alarm condition is first detected. Latched operation means that the alarm is set when the input change is first detected and will remain in that state until the group it is using is acknowledged. If the alarm is not latched, it will be removed as an alarm when the input condition returns to normal.

Default alarm state: when active.

DTMF Tag

The DTMF Tag is used to generate signaling messages for remote equipment. If a DTMF tag is available, it will be sent if the [SIGNAL] command is present in the Directory.

The tag can consist of 1 to 7 digits and may use any of the 16 DTMF digits including A, B, C, and D.

Default DTMF Tag: empty string - no signaling.

Interval Point

An Interval Point uses only the common settings. It cannot generate alarms, but can be interrogated to obtain readings.

Totalizer Point

Totalizers cannot generate alarms, but can be interrogated to obtain readings. In addition to the common ones, the totalizer also has the these settings:

Decimal Place

A decimal place can be inserted into the spoken message for a totalizer. Five decimal locations are available:

XXXXX.
XXXX.Y
XXX.YY
XX.YYY
X.YYYY

When the message is spoken, the digits to the left of the decimal (represented by X) and the digits to the right of the decimal (represented by Y) are spoken with the word 'point' between them. The format with the decimal at the far right with no 'Y' component is spoken without the word 'point'.

Default Decimal Place: no decimal place spoken.

Clear Code

The Clear Code is used to clear the totalizer to a zero reading. When the code is received, the Cv2 announces that the point has been cleared. The code can consist of 1 to 7 digits and may use any of the 16 DTMF digits including A, B, C, and D.

Default Clear Code: empty string - no code.

Units

If you require the Cv2 to speak engineering units after the numeric value of the Totalizer, set them in the Units section. Units are subdivided into three components -- Prefix, Unit and Suffix -- as shown below:

Prefix	Unit	Suffix
NONE	NONE	NONE
THOUSAND	CUBIC METERS	PER DAY
MILLION	CUBIC YARDS	PER HOUR
MILLI	CUBIC FEET	PER MINUTE
CENTI	PSI	PER SECOND
KILO	POUNDS	
MEGA	METERS	
GIGA	RPM	
	GALLON	
	BARRELS	
	PERCENT	
	PARTS PER MILLION	

Select from the three columns to construct a phrase describing the units for the point. One, two or three of the selections can be used; if all are set to NONE then nothing will be spoken after the numeric value.

Default Units: for all three sections is NONE.

Analog Point

Analog points generate alarms when the input value exceeds either the low or high setpoints. Like Digital and Watchdog points, they have Alarm State and DTMF Tag settings. The other settings in the Analog Point dialog box are unique to this type of point.

Calibrate

Calibration of an analog allows the conversion of the input voltage reading to a value that is expressed in engineering units. Setpoints are then assigned to the actual corresponding measurement, and when the point is interrogated, the reading is

announced in engineering units. Calibrate is a secondary dialog box that is activated from the Analog Point dialog box.

The relationship between the binary reading from the input analog converter and the decimal value that is used for setpoints and annunciation is established by setting the Binary and Decimal limits.

Binary Values

The full scale binary range, when an input port is configured for analog operation, is determined by the internal A to D converter which provides eight bits of resolution. The minimum binary value is 0 and the maximum value is 255 for the input range of 0 to +5 VDC.

If the sensor that is driving the input port does not produce a full scale output that corresponds to the Cv2 range, then the binary values can be adjusted to match the sensor. For example, if a sensor with a full scale range of 1 volt to 5 volts is used, then set the Cv2 with the binary minimum at 51 (255 x 1/5) and the binary maximum at 255. If the sensor produces outputs of between 0 and 2.5 volts, then set the binary minimum to 0 and the binary maximum to 127 (255 x 2.5/5).

The range of the sensor should use as much of the available Cv2 analog input range as possible in order to maintain a high resolution for the readings.

The minimum and maximum Binary values will correspond to the Decimal minimum and maximum that represent the actual readings, in engineering units, being monitored by the sensor.

Default Binary Values: 0 for the minimum and 255 for the maximum.

Decimal Values

Decimal values represent the real physical measurement being monitored by the sensor. For example, the current or voltage signals correspond to some engineering value such as gallons or PSI.

Set the decimal minimum to the low end of the range being measured. Set the decimal maximum to the high end of the sensor scale.

For example, if the minimum for the sensor is 50 rpm and maximum is 800 rpm, enter these values in the decimal section. Decimal values may be negative, e.g. a temperature range of -40ºC to +60ºC.

The range allowed for the decimal limits is -999.9 to +999.9. If values greater than these settings are needed, use a suitable prefix or suffix from Units and scale the reading to fit in the allowed range. If a sensor was connected to a meter with a range of 0 to 10,000 gallons per hour, then a suitable scale in the decimal values would be 0 as the minimum, 10 as the maximum, with Units set to read 'thousand' as the prefix before gallons.

Once the range of the decimal scale has been entered, then the high and low setpoints can follow. Both setpoints can be used within a single point. If the low setpoint is not required, set it to the decimal minimum; if the high setpoint is not needed, set it to the decimal maximum.

Default Decimal Values:

Minimum: 0
Maximum: +100.0
Low Setpoint: +25.0
High Setpoint: +75.0

Hysteresis

Hysteresis is a quick method of establishing the reset values for the high and low setpoints. After an analog reading has exceeded the setpoint, either high or low, it must pass through the reset value before it is considered to have returned to normal. This prevents a reading that is hovering around a setpoint from constantly going in and out of alarm. The more unstable the reading, the larger should be the hysteresis.

Hysteresis is calculated as a percentage of the decimal span and then used as an offset from the setpoint. For the low setpoint, the reset will be above the setpoint and for a high setpoint, the reset level will be below.

Default Hysteresis: 10% of decimal span.

Units

If you require engineering units to be announced after the numeric value of the Analog Point, set them in the Units section. Available units are listed in the Points - Totalizer section.

On/Off Output Point

In addition to the common settings described previously, there are two DTMF control codes used with an On/Off output point.

DTMF On Code

When the Cv2 receives the DTMF On code, it sets the output port to the On state. After the code has been received and the output port set, the Cv2 announces the current status of the output.

This code can be 1 to 7 digits in length and may use any of the 16 DTMF digits including A, B, C, and D.

Default DTMF On Code: an empty string - no On Code.

DTMF Off Code

When the Cv2 receives the DTMF Off code, it sets the output port to the Off state. After the Off code has been received and the output port cleared, the Cv2 announces the current status of the output.

This code can be 1 to 7 digits in length and may use any of the 16 DTMF digits including A, B, C, and D.

Default DTMF Off Code: an empty string - no Off Code.

Timed Output Point

In addition to the common settings, there are two DTMF control codes used with an Timed output point.

DTMF On Code

When the Cv2 receives the DTMF On code, it sets the output port to the On state and the timer begins operation. After the On code has been received and the output port set, the Cv2 announces the current status of the output. If the timer is set for a short

interval, the output port may have returned to the Off state before the announcement is made.

This code can be 1 to 7 digits in length and may use any of the 16 DTMF digits including A, B, C, and D.

Default DTMF On Code: an empty string - no On Code.

DTMF Off Code

When the Cv2 receives the DTMF Off code it sets the output port to the Off state and terminates the timer operation if it is currently running. The DTMF Off code will have no effect if the output timer has already expired. After the Off code has been received and the output port cleared, the Cv2 announces the current status of the output.

This code can be 1 to 7 digits in length and may use any of the 16 DTMF digits.

Default DTMF Off Code: an empty string - no Off Code.

4.7.3 Group section

In some applications, there may be a requirement for different types of alarms to alert different people. This is handled in the Cv2 by assigning alarms to different groups; there are six groups available for this purpose. Each alarm point has a selection list for setting the Using Group parameter. In the group dialog, the directory that it will be using is selected in the Shift control section. If the group activities are not going to be altered by changing shifts, use the shift 1 selection for all groups. If the use of directories by a group is going to change through the Shift Control, enter the appropriate directory into the shift selections.

Each Group has its own Acknowledge Code, Interrogate Code and Timer settings. Activities for a particular group are performed according to the Shift that is selected. Each shift uses one of the directories as the instruction source for the sequence of actions that occur during alarm conditions. If a different type of activity is required, such as after hours or weekends, the change can be quickly made by using another shift to control the Cv2 operation. There are also a number of special function settings that enable outputs and inputs to operate as controls and indicators for some internal Cv2 activities.

The settings that can be entered for each group are defined below:

Group Name

The Group Name is a 16-character text field where you may enter a description of the group. The name is used only for identification purposes; otherwise it is not required for operation of the Cv2. Normally the name is the same as the voice message programmed into the Cv2 for this group.

Default Group Name: an empty text string.

Acknowledge Code

The Acknowledge Code is a 1 to 7 digit DTMF string that is used to acknowledge the group and stop alarm transmission until a new alarm is detected. Each group can have a unique Acknowledge Code, or different groups can use the same code in order to be acknowledged simultaneously. In special cases where it is not desirable to have the Acknowledge Code permanently silence the alarm condition, append the digit '#' when you send the code and the Temporary Acknowledge Time in the General section will be used as an override.

Default Acknowledge Code: an empty text string.

Interrogate Code

The Interrogate Code is a 1 to 7 digit DTMF string that is used to make the Cv2 announce the condition of points in the group. Each group can have a unique Interrogate Code, or different groups can use the same code in order to generate the status of all groups at once.

Default Interrogate Code: an empty text string.

Enable This Group

To allow this group to be used for alarm reporting, this setting must be enabled. Points that are used for 'interrogate only' have this setting turned off. Groups may also be enabled or disabled via the local (or remote) programming phone.

Default Group Enable: disabled

Enable Auto Ack

If the Auto Ack function is used as a Directory command, it must enabled here for it to be valid for this group.

Default Auto Ack: disabled

Enable Ack Request

At the completion of an alarm announcement sequence, the Cv2 will query the called party with the phrase "Enter Acknowledge Code'. If this prompt is not required, clear the enable setting.

Default Ack Request: enabled

Timers

The Cv2 uses a two-stage timer to schedule the interval between reporting sequences. The first stage is controlled by the Short Timer interval which will repeat for the number of times set in Short Cycles before moving to the Long Timer. Once the Cv2 has reached the Long Timer stage it will continue to use this timer until a new alarm occurs.

Short Timer

The Short Timer can be set to any value between 0 and 255 minutes.
Default Short Timer: 5 min.

Short Cycles

The maximum number of short cycles is 9.
Default Short Cycles: 4

Long Timer

The Long Timer can be set to any value between 0 and 255 minutes.
Default Long Timer: 30 min.

Shift Selection

There are four shifts that can be used to alter the way that the Cv2 reports alarms. The group will use the currently active shift to select a directory for its operations. The shift in use at any particular time is determined by the last time that a Shift Change Code message was received. The Cv2 retains the current shift when it is powered down and will return to that shift when power is restored. Each time a Shift Change Code is received, the shift advances by one; if the Cv2 is currently set to shift 4 and the Shift Change Code is received, it will go to the shift 1 setting. After receipt of the Shift Change Code, the Cv2 responds with a spoken message indicating the new shift setting. The Shift Change Code is set in the General section.

This code can be 1 to 7 digits in length and may use any of the 16 DTMF digits including A, B, C, and D.

Default Shift Selection: Directory A for all shifts.

Special Function Outputs

Outputs can be assigned to indicate certain conditions within the Cv2. The three special function outputs are:

Alarm Active

This control allows any one of the eight output ports to be used as an indicator that an alarm is present in this group. The selected output will remain active while an alarm is present, acknowledged or not.

New Alarm

This control allows any one of the eight output ports to be used as an indicator that an unacknowledged alarm (New Alarm) is present in this group. The selected output will remain active until the group is acknowledged or all new alarms are removed.

Acknowledge Received

This control allows any one of the eight output ports to be used as an indicator that an Acknowledge Code has been received for this group. The output selected for this function should be set as a timed output port in the Hardware section. When an Acknowledge Code is received, the output will turn on and will remain on for the timed interval.

If the Cv2 is using more than one group, special function outputs of the same type can be assigned to the same output port in each group to provide a common indicator, or different groups can use different outputs in order to distinguish between the groups. Each output that is selected for either Alarm Active, New Alarm or Acknowledge Received can be used only for that one function. An output cannot be shared between two of these functions.

If the output selected for one of these functions is currently in use as a remote control point, the point will be removed.

Default Special Function Output: NONE.

Special Function Input - Acknowledge In

This special function can be used to designate one of the input ports as a local acknowledge for this group. When the specified input is active, the group will be acknowledged as though it had received a DTMF Acknowledge Code. If more than one group is being used, this setting can be the same port to create a common acknowledge, or different inputs can be selected to provide unique acknowledge controls.

Only Digital inputs can be used for this purpose. The selection shown in the list box is restricted to inputs that are set to digital in the Hardware section.

Default Special Function Input: NONE.

4.7.4 Directories

The Directories contain the sequences of actions that will occur when an alarm is activated in a group. Instructions for dialing, speaking, inserting delays and signaling are placed in the directory in the order in which they are to be performed. Each of the six directories can contain unique operational sequences. The directory summary displays the sequence of events

in a line-by-line format. A line represents one complete action, usually a cellular call. Edit the highlighted line by pressing Enter, double-clicking on the line, or selecting the Edit Line command from the menubar in the summary window. Lines can also be removed or inserted.

The editor dialog box displays two columns on the left, one for the Command entry and the other for the Value entry, if any. Buttons for each type of command are arranged on the right. Commands are entered when you click on the buttons on the right side of the dialog box. The command appears at the location currently selected -- shown by an active option button. If the command has an associated Value such as a telephone number or waiting interval, then the value field to the right of the command will be accessible for data entry. Commands can be added at the end of the list or inserted into the middle of the list.

The commands and their functions are:

Dial

The Dial command is the first command entry. Associated with the Dial command is a telephone number that is entered in the Value field; this is the number that will be called when an alarm condition is detected. The maximum length of the telephone number is 39 digits. The special character '!' can be inserted anywhere in the telephone number to create a two second delay in the dialing sequence.

When this command is encountered in the directory, the Cv2 initiates a call out on the cellular network and then maintains the call until the last command in the line is executed.

Dial can only appear as the first entry in the list.

Default Dial value: 0000

Wait

The Wait command is used to insert delays into the sequence. Associated with the Wait command is the time delay in seconds; range of the delay is from 0 to 255 seconds.

Wait can be a single entry on a line but if it is entered in a line with other commands it must be preceded by a Dial command.

Default Wait value: 0000

Auto Ack

If enabled for the group using this directory, the Auto Ack command causes the Cv2 to automatically acknowledge its alarms without receipt of any other code or signal. This command is used when it is anticipated that the called party will have no means of acknowledging the call. Unless absolutely necessary, this command should not be used since there is no assurance that the alarm message was properly received.

The Auto Ack command should be the last entry in the directory and must appear on a line by itself.

DTMF

The DTMF command will result in the string of DTMF digits in the associated Value field being transmitted. The maximum length of the DTMF string is 39 characters and the characters can be any of the 16 digits including A, B, C, and D. The special character '!' can be inserted anywhere in the DTMF string to create a two second delay.

DTMF must be preceded by a Dial command; it cannot be the first entry in the list. It can be used more than once in a list.

Default DTMF value: 0000

separated by 100 msec of quiet.

Alert must be preceded by a Dial command; it cannot be the first entry in the list. It can be used more than once in a list.

Voice

The Voice command causes stored voice messages for the Site ID, Group IDs and any points in the alarm state to be spoken. If Voice is the only command after Dial, the Cv2 will speak the alarm message three times or for one minute, whichever comes first.

Voice must be preceded by a Dial command; it cannot be the first entry in the list. It can be used only once in a list.

Answer

The Answer command causes the Cv2 to monitor the called line for activity before it begins to speak the alarm message. If the Cv2 is calling a voice or numeric paging terminal with an automated attendant, the Answer command will cause it to wait for the voice prompt before transmitting the pager number. Do not place the Answer command immediately after a Dial command if Call Progress is selected in the General section. This will cause the Cv2 to look for a voice response twice in a row and may prevent alarm announcements.

Signal

If a DTMF tag is programmed for a point and the Signal command is set, then only the DTMF tag for this point will be sent and the voice message will not be spoken.

Signal must be preceded by a Dial command; it cannot be the first entry in the list. It can be used once in a list.

Delete

Delete removes the selected command from the list. Commands that followed the deleted one are moved to fill in the empty space. If the first command is selected, then Delete will remove all commands for this line.

4.7.5 General

Settings that affect the overall operation of the Cv2 are entered in the General section.

Site Name

The Site Name is a 16 character text field that allows you to enter a description of the site where the Cv2 is to be located. Other than viewing in the General dialog box, this name has no other use. Normally it is set to match the voice message that is programmed as the Site Identifier.

Default Site Name: an empty text string.

Security Level

The Security level setting determines the actions that the Cv2 will perform when it receives an incoming call.

Level 1   The Cv2 announces the Site ID, any groups that are in the alarm state and prompts the caller to "Enter Command Code". An Access Code is not required.

Level 2   When the incoming call is answered by the Cv2, only the Site ID is announced; for further access to the Cv2 the caller must enter the Access Code.

Level 2   When the incoming call is answered by the Cv2, only the Site ID is announced; for further access to the Cv2 the caller must enter the Access Code.

Level 3   An incoming call results in the Cv2 coming off-hook with no announcement; the Access Code must be entered within ten seconds or the Cv2 will hang up.

Default Security Level: Level 1

Access Code

An Access Code is needed when calling into a unit configured for security levels 2 or 3.

If the Access Code is empty, all incoming callers will be permitted access to the program mode. If a code is programmed, it must be entered for remote programming otherwise the incoming call will be terminated. Local programming is always accessible.

This code can be 1 to 7 digits in length and may use any of the 16 DTMF digits including A, B, C, and D.

Default Access Code: an empty string.

Shift Change Code

The shift that is being used at any particular time is determined by the last time that a Shift Change Code message was received. The Cv2 retains the current shift when it is powered down and returns to that shift when power is restored. Each time a Shift Change Code is received, the shift advances by one. If the Cv2 is currently set to shift 4 and the change code is received, it will go to the shift 1 setting.

This code can be 1 to 7 digits in length and may use any of the 16 DTMF digits including A, B, C, and D.

Default Shift Change Code: an empty string.

Temporary Acknowledge Time

Temporary Acknowledge time is used as a safeguard with the Acknowledge Code. When the Temporary Acknowledge Time is set to Off it has no effect on Cv2 operations. Normally, receipt of the Acknowledge Code for a group will cause that group to cease alarm reporting activities until a new alarm is detected. When this control is set to any of the four available times (30, 60, 120 and 240 minutes), receipt of the Acknowledge Code, with the digit '#' appended to it, will cause the alarm activities to cease only for the time period set by the Temporary Time. After this timer expires, if the alarm condition has not been removed, the Cv2 will continue alarm functions as though the Acknowledge Code had not been received.

Default Temporary Acknowledge Time: Off

Call Progress

When Call Progress is enabled, the Cv2 will wait for the called party to speak before beginning the voice announcement. When Call Progress is enabled, there should not be any Answer commands directly following a Dial command in the directories. This will cause the Cv2 to look for a voice response twice in a row and may prevent alarm announcements.

Default Call Progress: disabled

Ring Output

Ring output is used to select one of the eight outputs to externally indicate that there is an incoming call. The output will follow the ringing cadence if selected.

Default Ring Output: None

Modem CD

Modem Carrier Detect is used to select one of the eight outputs to externally indicate that the modem has connected to an incoming call. This function is activated by the Modem Enable Code and is only asserted during the connection and not for the timer interval

Default Modem CD: None

Enable Modem Code

This code is required to allow the Cv2 to receive incoming over-the-air modem calls. Normally the Cv2 is in voice mode; following receipt of the Enable Modem code it will wait for a modem call for the time period set for the Modem CD in Hardware outputs. When this timer period has passed without a connection, the Cv2 returns to voice mode. If a connection is made, the Cv2 waits 30 seconds after the end of the modem session before returning to voice.

Default Enable Modem Code: empty string

Rings before Answer

Rings before answer determines how may ring cycles the Cv2 will wait before answering the call.

Default Rings before Answer: Two

4.7.6 Configuration Programming

Three types of data can be transferred between the Cv2 and the programming PC. Programming can be done locally with the programming cable or remotely using the modem in the PC to call the Cv2 over-the-air. If remote programming is to be used, the Cv2 must be configured for a Enable Modem code and a Modem CD output enabled in the General section. The selected output is configured in Hardware for the time interval that the Cv2 will wait for a modem connection.

The programming dialog defaults to local operation when it opens. Press the Use Modem button for remote programming.

For local programming the programming cable must be connected between the PC and the Cv2 before any data transfer is initiated. Select the correct COM port for the attached cable in the Serial Port box.

While the serial cable is attached, the Cv2 will be in programming mode and will not be operational.

For remote programming, press the Dial button to bring up the telephone number entry dialog. Enter the telephone number for the Cv2 including the prefix 1 and area code if necessary. Press Disconnect when the modem session is finished

Data is transferred in four-kilobyte packets at 9600 baud. The configuration database will take two packets to transfer; the number of packets in a voice data transfer will vary depending on how many points are used and how long the messages are.

Configuration Data

To transfer configuration data, use the two buttons in the Configuration box. Press the Write To Cv2 button to transmit the configuration database from the PC into the Cv2 or press the Read From Cv2 button to transfer the configuration from the Cv2 to the PC .

Voice Messages

To transfer voice data, use the buttons in the Voice box. Press the Write to Cv2 button to move voice messages from a file in the PC to the Cv2. The recorded messages in the Cv2 can be read and stored to a file by pressing the Read From Cv2 button. At the end of each voice programming session, it is advisable to read the voice information in the Cv2 and store it to file.

Vocabulary

If the stored vocabulary section in the Cv2 memory is corrupt it will be necessary to transfer the vocabulary from the PC to the Cv2. The most common symptom associated with a corrupt vocabulary is the absence of the female voice prompts during operation and programming. If problems are experienced with any of the voice operations the vocabulary should be replaced. This is done by pressing the Write Vocabulary button to transmit the vocabulary data to the Cv2.

Writing the vocabulary to the Cv2 will delete all of the user stored messages. If these messages were previously saved to a file they can be transferred after the vocabulary is written into the Cv2, otherwise they will have to be recorded again.

4.8   Configuring the Cv2 - Basic mode

When configuring the Cv2 in Basic mode the easiest way to set the unit up is by running the Basic Wizard which will step you through all of the required entries. All of the variables presented in the wizard are also accessible using the menus and taskbar.

4.8.1 Alarms section

Use this section to establish how the input signals are conditioned to become alarms.

Directory

An active alarm can be set to use either Directory A or Directory B for making call out. Unused alarm inputs are set for disabled. Each alarm can select it own Directory setting.

Default: disabled

Format

All alarm inputs have the same format setting. Four possible arrangements are available:

Normally High, Normally Low, Normally High - Latched and Normally Low - Latched

Latched alarms hold the alarm state even if the input returns to normal. The alarm is cleared when the Cv2 is acknowledged.

Default: Normally Low

Debounce

In order for a change of state to be considered valid, an input must remain in the same state for the duration of the Debounce time. Each input has an independent debounce timer but all timers use the same time value when they are reloaded.

The common timescale can be set for either seconds or minutes. Maximum values are 65535 minutes and 1638 seconds.

Default: 1 second

4.8.2 Control section

Use the Control section to configure the hardware outputs if the Cv2 is going to be used for remote control. Three of the control outputs are user programmable and can be individually set for either on/off or timed operation; five outputs are used for the special functions.

Format

Each control can be either an On/Off or a Timed type.

Default: disabled

DTMF On Code

When the Cv2 receives the DTMF On code, it sets the control to the On state and, if it is set as a timed type, starts the timer. After the On code has been received and the output is set, the Cv2 announces the current status of the control. If the timer is set for a short interval, the control may have returned to the Off state before the announcement is made.

This code can be 1 to 7 digits in length and may use any of the 16 DTMF digits including A, B, C, and D.

Default DTMF On Code: an empty string - no On Code.

DTMF Off Code

When the Cv2 receives the DTMF Off code it sets the control to the Off state and, if it is set as a timed type, terminates the timer operation if it is currently running. The DTMF Off code will have no effect if the timer has already expired. After the Off code has been received and the control is cleared, the Cv2 announces the current status of the control.

This code can be 1 to 7 digits in length and may use any of the 16 DTMF digits.

Default DTMF Off Code: an empty string - no Off Code.

Interval

Each of the four controls has an independent duration timer that can be set to have either a seconds or minutes timescale. Maximum values are 65535 minutes and 1638 seconds.

Default: 1 second

4.8.3 General

Settings that affect the overall operation of the Cv2 are entered in the General section.

Site Name - same as for Advanced mode

Rings to Answer - same as for Advanced mode

Temporary Ack Time - same as for Advanced mode

Enable Call Progress - same as for Advanced mode

Enable Modem Code - same as for Advanced mode

Access Code - same as for Advanced mode

4.8.4 Directories

A Basic Directory contains a list of telephone numbers that will be called and followed by a voice message when the Cv2 is in operation; each directory can contain a different list. Associated with each directory is a unique Acknowledge code, Interrogate code and Cycle timer.

If the requirements of the system you are setting up cannot be met with the basic phone number and voice commands in the directory, you can switch to the advanced editor while

keeping the rest of the configuration in basic mode.

Insert - Insert a new phone number at the highlighted location

Delete - Delete the phone number at the highlighted location

Edit - Modify the phone number at the highlighted location

Advanced - View or edit the directory with the Advanced editor

Acknowledge Code

The Acknowledge Code is a 1 to 7 digit DTMF string that is used to acknowledge the directory and stop alarm transmission until a new alarm is detected. Each directory can have a unique Acknowledge Code, or they can both use the same code in order to be acknowledged simultaneously. In special cases where it is not desirable to have the Acknowledge Code permanently silence the alarm condition, append the digit '#' when you send the code and the Temporary Acknowledge Time in the General section will be used as an override.

Default Acknowledge Code: an empty text string.

Interrogate Code

The Interrogate Code is a 1 to 7 digit DTMF string that is used to make the Cv2 announce the condition of alarms using the directory. Each directory can have a unique Interrogate Code or both directories can use the same code.

Default Interrogate Code: an empty text string.

Cycle Timer

When the end of a directory has been reached without receipt of an Acknowledge code, the Cv2 waits for the time set in the Cycle timer before repeating the alarm transmission sequence. This repetition will continue until the unit is acknowledged.

5   Remote Data Access

External equipment connected to the serial port can be accessed by calling the Cv2 with a remote modem. The Cv2 can determine whether the data is intended for a remote programming session or if it is to be routed to the attached equipment. To allow an incoming modem call to be answered, the caller must first send the Modem Enable Code to temporarily set the Cv2 into data mode and the output or control used for the Carrier Detect (CD) output should be programmed to have an appropriate timer interval. The CD output is a discrete pin on the Cv2's outputs and is not present at the serial connector. It can be used to signal the external equipment that a connection has been made.

The suggested serial cable is shown in Figure 14. Do not use the programming cable that is supplied with the Cv2 or any cable that asserts the DTR line on the CV2 for external data transfer.
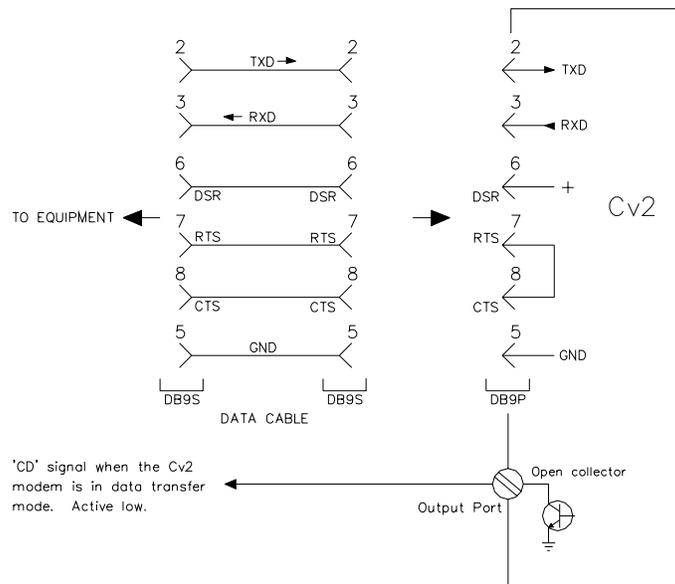
Figure 14 - Data Cable for External Equipment

6   Voice Storage and Configuration with the Telset

6.1 Setup

The Cv2 can be configured by transferring a database from the PC, either in Basic or Advanced mode, or by using the programming phone. All of the variables in Basic mode are accessible through the telset; if the Cv2 has been programmed in Advanced mode only the following items are available:

  Directory line editor

  All voice phrases

  Rings to answer, call progress enable, access code, modem enable code

  Cell phone status

  Outside line

For Advanced mode telset programming, ensure that the database in the unit is configured properly. The Cv2 must contain a valid database in order to determine which points have associated voice messages.

The usual method for voice programming is with a phone set plugged directly into the unit; however it is also possible to program voice messages remotely by calling the Cv2 over the network.

If you are programming a stand-alone Cv2, a DTMF (TouchTone) telephone set is required to enter the voice messages. A rotary dial pulse telephone set will not work here. Connect the phone set to port J1. If you have a package model, the phone set will already be in the enclosure.

In place of the *Enter* key or carriage return which you would use to enter data from a keyboard, the Cv2 interprets the characters ✳✳ as the *Enter* command. The programming sequence is controlled by pressing a single digit followed by the ✳✳ digits. Ensure that no more than one second separates the two ✳ digits.

6.2 Access

To begin a local programming session, lift the telephone handset to your ear. To perform remote programming call the site from a remote telephone set.

The Cv2 has stored voice prompts to guide you through the programming mode. The first message you will hear is "Enter Command Code." At this time you can interrogate, acknowledge or control the unit. If the Access Code is entered, the prompt changes to "Enter Program Code" and all LEDs illuminate. The same action occurs if you are calling in remotely.

With the security level set to '1' with local programming, the Cv2 will advance to the program mode automatically after 5 seconds if an access code is not entered. ***An access code is needed for remote and local programming with security level settings 2 and 3.***

6.3 Programming Commands

After the security requirements have been met, you can begin programming voices or changing the configuration by entering one of the programming commands. The following example is for part of an advanced mode programming session. The sequences for both Basic and Advanced modes are shown in detail at the end of this section.

Directory programming, where the called numbers are entered, requires care to ensure that these numbers are valid. If the Cv2 is unable to successfully complete calls it will take action to ensure that the cellular network is not adversely affected. These actions are detailed in the "Getting Started" section at the beginning of the manual.

The following example shows how to enter voice messages using a telephone set.

Cv2:   "Enter Program Code"

1✱✱ - Voices

  Cv2:   "Enter Voice Code"

After the Cv2 responds with this prompt it waits for you to enter a selection from the voice menu. The choices at this point are:

 1✱✱ - Record or Play Back Site ID and Group Voices

   Cv2:   "Site ID is *Ajax Compressor Station*"

   (The first time the site ID, or any other voice message, is programmed, the Cv2 will have either no voice message or a factory test message.)

   To record the new site ID, press 2✱✱ and speak the desired name after the prompt 'beep' is returned.

   The Cv2 detects when you stop speaking, and automatically plays back the message. Pauses between words may cause the recording to terminate.

   If the message is acceptable, press ✱✱ to advance to the next voice.

   If it is not, keep using 2✱✱ and repeat the message until it is satisfactory, then press ✱✱ to accept the current recording. The next prompt you will hear is:

   Cv2:   "Group One is *Electrical*" *(Group voices are not used in Basic mode)*

   Again, use 2✱✱ to record the name of the group, and ✱✱ to advance. The Cv2 will automatically advance through all six groups, then return to the "Enter Program Code" prompt.

   If you don't need to go through all the groups, press #✱✱ at any time to go back to the main menu ("Enter Program Code" prompt).

 4✱✱ - Record or Play Back Points Voices

   Cv2:   "Point One is *Power Failure*"

   As with the Site and Group IDs (Program Code 1), press 2✱✱ to record a new voice message, ✱✱ to advance to the next voice, or #✱✱ to exit to the main menu.

   Unless you exit, the Cv2 will automatically advance through all the enabled points, then back to the main menu.

 5✱✱ - Erase Voices

   Cv2:   "Enter Empty Code"

   Press #31✱✱ to confirm that you want to erase all voices.

6.4 Telset Programming Summary

A Cv2 is set for Basic mode programming when it is shipped. The only way to change it to the Advanced mode is by using the PC configuration software.

The different sequence of prompts and the variables that can be accessed in each mode are shown in the flow chart.

When editing Directories in Advanced mode the commands are entered in the same format as they appear on the summary screen on the PC. The following codes correspond to the commands found on the PC programming screen:

#0 [DIAL]	#6 [VOICE]
#1 [WAIT]	#7 [SIGNAL]
#2 [AUTO ACK]	#8 '!' 2 second pause in Dial or DTMF
#3 [DTMF]	## '#' digit
#4 [ALERT]	** Accept
#5 [ANSWER]	

Directory entries in Basic mode consist of the telephone number followed by **✱✱**. This is the equivalent of #0 <telephone number> #6 **✱✱** in Advanced mode. The Cv2 will accept either entry method regardless of which programming mode is being used.

6.5   Programming Flowchart

[1][*][*] **Voice Menu (Basic and Advanced mode)**

Cv2: "Enter Voice Code"

You: [1][*][*]   Playback or record voices for Site ID and Groups 1 to 6

      [2][*][*]   Playback or record voices for Alarm Inputs 1 to 8 (Basic mode only)

      [3][*][*]   Playback or record voices for Control Outputs 1 to 3 (Basic mode only)

      [4][*][*]   Playback or record voices for enabled Points 1 to 30

      [5][*][*]   Erase All Voices

      [#][*][*]   Exit to Main Menu

      [*][*]   Exit to Main Menu

Playback or Record Voices

Cv2:   "Site is" *"Ajax Compressor Station"*
or   "Group 1 is" *"Electrical"* (Advanced mode only)
or   "Alarm 1 is" *"Power Failure"* (Basic mode only)
or   "Control 1 is" "*Remote Shutdown*" (Basic mode only)
or   "Point 1 is" *"Power Failure"*

You: [2][*][*]   Record new voice

       [#][*][*]   Exit to Voice Menu

       [*][*]   Accept current recording and advance to next voice

Recording:

Cv2:   "beep"
You: "*Acme Compressor Station*". Recording stops when you stop speaking.

Erase All Voices

Cv2:   "Enter Voice Empty Code"
You: [#][3][1][*][*]   Confirm erase command

      [#][*][*]   Exit to Voice Menu

      [*][*]   Exit to Voice Menu

[2][*][*] **Directory Menu (Basic and Advanced mode)**

Cv2: "Enter Directory:

You: [0][*][*]   Speak the list of Directory Codes

      [1][*][*]   Select Directory A

      [2][*][*]   Select Directory B

      [3][*][*]   Select Directory C

      [4][*][*]   Select Directory D

      [5][*][*]   Select Directory E

      [6][*][*]   Select Directory F

      [#][*][*]   Exit to Main Menu

      [*][*]   Exit to Main Menu

Directory Line

Cv2:   "Directory A Line 1 is DIAL 2559545 VOICE"

You: `2` `*` `*`   Edit current line

`3` `*` `*`   Delete current line

`4` `*` `*`   Edit a new line to be inserted before current line

`#` `*` `*`   Exit to Directory Menu

`*` `*`   Accept current line and advance to next line. In Basic mode only, if this line is empty and the directory is A or B, advance to Cycle Timer,

Line Editing

Cv2:   "beep"

You: `1` `2` `3` `4` `5` `6` `7`   new line is [DIAL] 1234597 [VOICE]

`#` `0`   `1` `2` `3` `4` `5` `6` `7`   `#` `6` new line is [DIAL] 1234567 [VOICE]

Cycle Timer (Basic Mode Only)

Cv2:   "Directory A Timer is 5 minutes"

You: `2` `0` `*` `*`   Change timer to 20 minutes (range: 1-255 min)

`#` `*` `*`   Exit to Directory Menu

`*` `*`   Accept timer and advance to Acknowledge Code

Acknowledge Code

Cv2:   "Acknowledge Code is 123"

You: `5` `5` `*` `*`   Change acknowledge code to 55 (max 8 digits)

`#` `*` `*`   Exit to Directory Menu

`*` `*`   Accept acknowledge code and advance to Interrogate Code

Interrogate Code

Cv2:   "Interrogate Code is 456"

You: `9` `9` `*` `*`   Change interrogate code to 99 (max 8 digits)

`#` `*` `*`   Exit to Directory Menu

`*` `*`   Accept interrogate code and exit to Directory Menu

`3` `*` `*` **General Configuration Menu (Basic and Advanced mode)**

Answer Rings

Cv2:   "Answer Rings is 4"

You: `2` `*` `*`   Change number of rings to 2 (range: 1-9)

`#` `*` `*`   Exit to Main Menu

`*` `*`   Accept answer rings and advance to Call Progress Control

Call Progress Control (busy signal and answer detect)

Cv2:   "Dial Control is Off"

You: `0` `*` `*`   Turn call progress detector off

1 * *	Turn call progress detector on
# * *	Exit to Main Menu
* *	Accept call progress control and advance to Access Code

Access Code

Cv2:   "Access Code is empty"

You:	1 1 * *	Change access code to 11 (max 8 digits)
	# * *	Erase access code
	* *	Accept access code and advance to Temporary Acknowledge Timer

Temporary Acknowledge Timer

Cv2:   "Acknowledge Timer is code 2"

You:	0 * *	Turn Temporary Acknowledge Timer off
	1 * *	Change temporary acknowledge timer to 30 minutes
	2 * *	Change temporary acknowledge timer to 60 minutes
	3 * *	Change temporary acknowledge timer to 120 minutes
	4 * *	Change temporary acknowledge timer to 240 minutes
	# * *	Exit to Main Menu
	* *	Accept timer and advance to Modem Code

Modem Code

Cv2:   "Modem Code is empty"

You:	2 2 * *	Change modem code to 22 (max 8 digits)
	# * *	Erase modem code
	* *	Accept modem code and exit to Main Menu

4 * * Alarm Input Menu (Basic mode only)

Directory Assignment

Cv2:   "Alarm 1 uses directory A"

You:	1 * *	Change to directory A
	2 * *	Change to directory B
	0 * *	Disable input
	# * *	Exit to Main Menu
	* *	Accept directory assignment, advance to next alarm or Alarm Format

Alarm Format

Cv2:   "Alarm Format is 0"

You:	0 * *	Change format to normally low inputs
	1 * *	Change format to normally high inputs
	2 * *	Change format to normally low latched inputs
	3 * *	Change format to normally high latched inputs

`#` `*` `*`   Exit to Main Menu

`*` `*`   Accept alarm format and advance to Debounce Scale

Debounce Scale

Cv2:   "Alarm Timer is seconds"

You: `0` `*` `*`   Change debounce scale to seconds

`1` `*` `*`   Change debounce scale to minutes

`#` `*` `*`   Exit to Main Menu

`*` `*`   Accept debounce scale and advance to Debounce Time

Debounce Time

Cv2:   "Alarm Timer is 01 seconds"

You: `5` `*` `*`   Change timer to 5 seconds (range: 0-6 sec, 1-255 min)

`#` `*` `*`   Exit to Main Menu

`*` `*`   Accept debounce timer and exit to Main Menu

`5` `*` `*` Control Output Menu (Basic mode only)

Output Format

Cv2:   "Control 1 is On/Off"

You: `0` `*` `*`   Change format to on/off operation

`1` `*` `*`   Change format to timed operation

`#` `*` `*`   Exit to Main Menu

`*` `*`   Accept output format and advance to next output or Main Menu

Change Format

Cv2:   "Format is On/Off"

You: `0` `*` `*`   Change format to on/off operation

`1` `*` `*`   Change format to timed operation

`#` `*` `*`   Exit to Control Output Menu

`*` `*`   Accept output format and advance to On Code

On Code

Cv2:   "On Code is empty"

You: `1` `1` `*` `*`   Change on code to 11 (max 8 digits)

`#` `*` `*`   Erase on code

`*` `*`   Accept on code and advance to Off Code

Off Code

Cv2:   "Off Code is empty"

You: `1` `1` `*` `*`   Change off code to 11 (max 8 digits)

`#` `*` `*`   Erase off code

`*` `*`   Accept off code and return to Control Output Menu (type = On/Off)
or advance to Timer Scale (type = timed)

Control Timer Scale

Cv2:   "Control Timer is seconds"

You: `0` `*` `*`   Change timer scale to seconds

        `1` `*` `*`   Change timer scale to minutes

        `#` `*` `*`   Exit to Main Menu

        `*` `*`   Accept timer scale and advance to Control Timer Value

Control Timer Value

Cv2:   "Control Timer is 01 seconds"

You: `5` `*` `*`   Change timer to 5 seconds (range: 0-6 sec, 1-255 min)

        `#` `*` `*`   Exit to Main Menu

        `*` `*`   Accept timer value and return to Control Output Menu

`8` `*` `*` Reset Database (Basic and Advanced mode)

Cv2:   "Enter Empty Code"

You: `#` `3` `1` `*` `*`   Confirm reset command

        `#` `*` `*`   Exit to Main Menu

        `*` `*`   Exit to Main Menu

`9` `*` `*` Cellphone Status (Basic and Advanced mode)
see Section 9 for interpretation

Received Signal Strength (RSSI)

Cv2:   "Code One is 8, 8, 8, 8, ..."   0=very poor, 15=very good

You: `#` `*` `*`   Exit to Main Menu

        `*` `*`   Advance to Query Service

Service

Cv2:   "Code Two is 3"

You: `#` `*` `*`   Exit to Main Menu

        `*` `*`   Advance to Query SID

SID

Cv2:   "Code Three is 1 2 3 4 5"

You: `#` `*` `*`   Exit to Main Menu

        `*` `*`   Advance to Query NID

NID

Cv2:   "Code Four is 1 2 3"

You: `#` `*` `*`   Exit to Main Menu

        `*` `*`   Advance to Query Transceiver State

Transceiver State

Cv2:   "Code Five is 8 1"

You: `#` `*` `*`   Exit to Main Menu

           `*` `*`   Advance to Query Channel / Power

Channel / Power

Cv2:   "Code Six is 1 2 3 point 4 5"

You: `#` `*` `*`   Exit to Main Menu

           `*` `*`   Advance to Query Service Option

Service Option / Protocol Revision

Cv2:   "Code Seven is 1 2 3 point 4"

You: `#` `*` `*`   Exit to Main Menu

           `*` `*`   Advance to Query Extended State

Extended State / Drop Reason / Online Mode

Cv2:   "Code Eight is 1 point 2 3 point 4"

You: `#` `*` `*`   Exit to Main Menu

           `*` `*`   Exit to Main Menu

`0` `*` `*` Cellphone Programming (Basic and Advanced mode)

Read ESN

Cv2:   "ESN is 1 2 3 point 1 2 3 4 5 6 7 8"

You: `#` `*` `*`   Exit to Main Menu

           `*` `*`   Advance to Edit MIN

Edit MIN (Mobile Identification Number)

Cv2:   "Mobile Number is 8 0 0 5 5 5 1 2 1 2"

You: `8` `0` `0` `2` `6` `8` `2` `6` `4` `6` `*` `*`

           Change MIN to 800-268-2646 (must be 10 digits)

           `#` `*` `*`   Exit to Main Menu

           `*` `*`   Accept MIN and advance to Query State

`*` `*` `*` Query Software Version (Basic and Advanced mode)

Cv2:   "Eight point Zero Zero"

7 Voice Editor

7.1 Voice Editor

Access to the Voice Editor is through the drop-down File menu.

The voice editor is a utility for manipulating and organizing the individual phrases that the Cv2 uses to identify groups, points and the site ID. These phrases are packaged into a message (.msg) file that can be transferred to and from the unit. Adding, changing or removing phrases can be done either through the programming telephone set or by editing a message file and transferring it to the unit.

The phrases that make up the message file are displayed in the Site ID, Groups and Points list boxes. A message file may contain any number of phrases up to the maximum of 37 when every phrase is programmed for a system with all points and groups active. A message file can be constructed from an existing one or entirely with new phrases.

If you want to edit an existing message file, use the Load button in the Message section to select a file. The contents of the message file will be displayed with the designation "in .msg file" if a phrase is present or with the designation "empty" if there is no phrase for that location. If you have the configuration database that is associated with this message file loaded in the main program and if the names for each phrase have been programmed in the database, you can turn on the Use Text Names to include the names of the phrases in the display. Do not display the text names if they do not correspond with the associated phrases.

If the pre-recorded message file is not on disk but is present in the Cv2, it can be downloaded by selecting the Read from ProTalk button in the Message section.

Adding individual phrase (.vox) files is done by selecting the location where the phrase will be used and then pressing the Load button in the Phrase section (or double-clicking the location). The file selected in the Open File dialog will be placed at that location.

Press the Clear button to remove a selected phrase.

Individual phrases that were part of a previously recorded message file can be saved to disk by pressing the Save button. A suitable name for the file is required; the program does not attempt to provide a default name even if there is a text name available. External files (.vox files taken from a phrase file on the hard drive) that have been loaded cannot be saved in this manner; use the Windows Explorer to copy these files.

All of the information concerning phrases shown in the editor can be saved to file by pressing the Save button in the Configuration section. Previously saved configurations can be restored by pressing the Load button in the Configuration section. Loading a new configuration replaces all currently displayed data.

Important: The phrase and message data is not embedded in the configuration file, it only contains pointers to the input data members. When the program generates a new message file it locates the source phrase data by using either the file names of the phrases or the loaded message file. If these files are relocated after they have been selected in the editor, an error will occur when the message file is being generated.

Controls in the Voice Editor dialog box are:

Individual Voice Phrase Section

Hardware

The setting of the tab control at the bottom of the box determines which part of the message configuration is shown in the phrase list boxes.

Use Text Names

This check box controls the display of the text names (Site Name, Point Name and Group Name) that are in the background programming session. Turning this function on is only of use if the text names match the phrases in the current voice editing session. Information is these text fields is for reference and is not used by the Cv2.

Site ID Tab

A single text line displaying the current status of the Site ID phrase.

Depending on what has been loaded into the editor, one of the following will appear in the location for the Site ID phrase.

empty	the location contains no phrase data
in .msg file	the phrase is contained in a loaded message file
<File path\file name>	the phrase is in an individual file has been loaded at this location

Groups Tab

A 6 line list box displaying the current status of the group phrases.

Contents of each line is as described for the Site ID above.

Points Tab

A 30 line list box displaying the current status of the point phrases.

Contents of each line is as described for the Site ID above.

Load

The position in the list where the phrase is to be used must be selected before pressing this button. A File Open dialog box is used to select the required file. The file type has the extension .vox and must have either been processed by the wave converter or previously extracted from a message file.

Clear

The position in the list where the phrase is to be removed must be selected before pressing this button.

Save

The location for the phrase that is to be saved must be selected before pressing this button. A File Save dialog box is used to set the file name and location. The saved file is extracted from the currently loaded message file and saved with the .vox extension.

Message File Section

Load

A File Open dialog box is used to select the required message file with the .msg extension. Message files contain the phrases used by the Cv2 to identify Site ID, Groups and Points.   If there are individual phrases with a file location present you will have the option of writing over them or leaving them in place when the new message file is loaded.

Save

A File Save dialog box is used to select the location and name of a message file. The saved file is built from the information in the individual phrase list boxes. Where a file name for an external phrase file is found, that file is opened and the data merged into the output message file. Where the phrase is contained in the currently loaded message file, the phrase data is extracted and merged into the output message file. If the save process is unable to open any of the source files an error will be reported and the process ended.

Read from ProTalk

Before this button is pressed, a Cv2 must be connected to the PC with the communications cable. After the message file has been read from the unit a File Save dialog box opens to allow the location and name to be entered. This file now becomes the loaded message file as though it was selected by the Load operation.

Write to ProTalk

A message file that is currently stored on disk can be transferred to the Cv2. The file must be on disk; the information in the current voice editing session is not used directly. If you want to transfer the current session it must be saved to disk first.

Com Port

The setting of this combo box determines which serial port is used for the communications with the Cv2.

Configuration File Section

Load

A File Open dialog box is used to select a previously saved configuration file with the .vcf extension.

Save

A File Save dialog box is used to select the location and name of the stored configuration file. A configuration file does not contain any phrase data, only pointers to the source location for the phrases. The file is saved with a .vcf extension.

7.2 Wave File Conversion

Access to the wave file converter is through the drop-down File menu.

The Cv2 uses Adaptive Differential Pulse Code Modulation (ADPCM) operating at 32 kbps to convert audio signals to digital form. ADPCM converted voice phrases are specifically delimited and padded for use by the Cv2. This wave file converter allows you to create phrase files using the audio functions available in a PC instead of recording the phrases through the programming telephone.

When creating a phrase on the PC, the recorder should be set for either 8 or 16 bit sampling at a rate of 8,000 bytes per second. Higher sample rates do not produce better audio quality but if a faster rate is used it should be a multiple of 8,000. Stereo files cannot be converted.

Press the Source button to select the wave (.wav) file that is to be converted. Press the destination button to select a name and location for the output ADPCM file. Press Convert to generate the output file.

The generated ADPCM tile has the extension .vox and can be used by the Voice Editor to create message files for the Cv2.

8 Specifications

8.1 General

Alarm Inputs	• 8 inputs: analog or digital, latching or momentary; plug in screw terminal block.
	• analog: 0 to 5 VDC, 100k input impedance
	• digital: normally open or normally closed, ground closure or +10 to +30 VDC input; optionally configured for acknowledge input.
Control Outputs	• 8 independent open collector outputs controlled by DTMF codes; voice announcement when operated; plug in screw terminal block; optionally configured for alarm status indication. Rated 0.4 A, 50 volts max.
Programming Connection	• DB9 - RS232, 9600 baud
Record Connection	• RJ11, using standard telephone set
Voice Quality	• Digitized, toll quality, 32 kbps ADPCM
Power	• +11 to +28 VDC, 125 mA idle, 750mA transmitting; plug in screw terminal block
Environment	• -30ºC to +50ºC
Physical	• 8.5"L x 6.0"W x 3.0"D
Cellular Telephone	• Internal Kyocera M200 CDMA
Antenna Impedance	• 50 ohms

8.2 Programmable Features

Voice Messages	• Site identification, Group identification, Alarm inputs, and control outputs; 60 seconds maximum, non-volatile
Alarm Type	• Individually configured for digital normally open, digital normally closed, or analog 0-5 V
Analog Alarm Range	• -999.9 to +999.9
Alarm Groups	• Alarms can be assigned to one of 8 groups. All alarms in a group use the same directory when calling out.
Shifts	• Up to 4 shifts can be used. The current setting of the shift instructs a group to use one of the six directories.
Interval Timer	• Two-stage timer which uses the short interval several times before switching to a long interval. Short and long

intervals are adjustable from 1 to 249 minutes; the short timer can be used from 1 to 9 times.

Acknowledge Code
- Stops the transmission cycle when received. 1 to 7 DTMF digits with individual codes allowed for each group.

Interrogate Code
- Forces annunciation of all active alarms; analog levels, totalizer readings and interval timers. 1 to 7 DTMF digits with individual codes allowed for each group.

8.3 Telephone

Directory Structure
- Up to 20 numbers in each of the 6 directories; each directory can hold up to 200 digits.

Access
- Multiple methods of security are available to restrict access and to control the unit.

8.4 Options

Packaged model
- NEMA 4 enclosure

- Battery-backed power supply

- Programming telephone set

9 Cellphone Status Codes

Following is summary of the transceiver codes that can returned to the telset from the cellphone configuration section.

9.1 Received Signal Strength Indicator - RSSI (code 1)

Speaks "Code One is 8, 8, 8, 8, ..." where 0 = very poor, 15 = very good

9.2 Service (code 2)

Speaks "Code Two is AB", where
    A = Current Service

        OFF = No Service
        0: Analog Service
        1: CDMA Cellular Service
        2: CDMA PCS Service
        3: Sleep Mode
    B = roaming indicator
        0 = normal
        1-8 = roaming

9.3 SID (code 3)

Speaks the 5 digit System Identification

9.4 NID (code 4)

Speaks the 3 digit Network Identification

9.5 State (code 5)

Speaks "Code Five is AB" where AB is the two character transceiver state
        00: No Service (either mode)
    Analog States:
        01: Initialization
        02: Idle
        03: Voice Channel Initialization
        04: Waiting For Order
        05: Waiting For Answer
        06: Conversation
        07: Release
        08: System Access
    CDMA States:
        81: Initialization
        82: Idle
        83: Voice Channel Initialization
        84: Waiting For Order
        85: Waiting For Answer
        86: Conversation
        87: Release
        88: Update Overhead Information
        89: Mobile Station Origination Attempt
        8A: Page Response
        8B: Order/Message Response
        8C: Registration Access
        8D: Message Transmission

9.6 Channel / Power (code 6)

Speaks "Code Six is ABC point DE", where
    ABC = current transceiver center frequency channel
    DE = current transmitter power (negative dBm)

9.7 Service Option / Protocol Revision (code 7)

Speaks "Code Seven is ABC, point D", where:
    ABC = service option
      000: Rejection or Wildcard Voice
      001: Basic Variable Rate Voice
      002: Mobile Station Loopback
      003: Enhanced Variable Rate Voice
      004: Asynchronous Data (IS-99)
      006: Short Message (IS-637)
      007: Internet Standard PPP Packet Data (IS-657)
      009: Mobile Station Loopback over Rate Set 2
      012: Asynchronous Data over Rate Set 2
      014: Short Message using Multiplex Option 2
      015: Internet Standard PPP Packet Data over Rate Set 2
      017: High Rate Voice
      018: Over The Air Provisioning Administration over Rate Set 1
      019: Over The Air Parameter Administration over Rate Set 2
      033: 3G Packet Data
      054: 3G Markov SO
      055: G Loopback SO
      104: Asynchronous Data (IS-707)
      107: Internet Standard PPP Packet Data (IS-707)
      800: Speech Service Option (13K)
      801: Speech Service Option (IS-96)
      802: Markov Service Option
      803: Data Services Service Option, HACK Packet Method
      828: Markov Service Option (13k)
      829: Wide Lock Loop phone off hook
      830: Markov Service Option (8k)
      831: Markov Service Option (13k)
      832: Internet Standard PPP Packet Data Service (QC Proprietary) over Rate Set 2
      833: Asynchronous Data Service (QC Proprietary) over Rate Set 2

    D = Current Protocol Revision in Use
      0: Unrecognized / non-CDMA
      1: IS-95/J-STD-008
      2: IS-95-A
      3: IS-95-A + TSB74
      4: TIA/EIA-95-B Phase 1
      5: TIA/EIA-95-B Phase 2
      6: IS-2000 (Release 0)
      7: IS-2000-A (Release A)

9.8 Extended State/ Drop Reason/ Online Mode (code 8)

Speaks "Code Eight is A point BC point D", where:

A = Power Available
- 0: No Power to Transceiver
- 1: Module Power is On

BC = Call Dropped Reason
- 00: Phone is Offline
- 01: Phone is CDMA locked until Power Cycle
- 02: Phone has No Service
- 03: Call has Ended Abnormally
- 04: Received Intercept from Base Station - Origination only
- 05: Received Reorder from Base Station - Origination only
- 06: Received Release from Base Station - No Reason Given/Normal
- 07: Received Release from Base Station – Service Option Reject
- 08: Received Incoming Call from Base Station
- 09: Received Alert Stop from Base Station - Incoming only
- 10: Client Ended the Call
- 11: Received End Activation - Over-the-Air Service Provisioning Call only
- 12: Mobile Call Aborts the Origination/Conversation
- 13: Call Origination or Call Failed due to NDSS Failure
- 14: Call End due to Maximum Access Probe

D = Online Mode
- 0: Mode Information Not Initialized
- 1: Phone Is in ONLINE Mode
- 2: Phone Is in OFFLINE Mode
- 4: Phone Is Powering Off
- 5: Phone Is Resetting/Power Cycling

10 Warranty

Barnett Engineering Ltd. warrants that all equipment supplied shall be free from defects in material or workmanship at the time of delivery. Such warranty shall extend from the time of delivery for a period of one year. Buyer must provide written notice to Barnett Engineering Ltd. within this prescribed warranty period of any defect. If the defect is not the result of improper usage, service, maintenance, or installation and equipment has not been otherwise damaged or modified after delivery, Barnett Engineering Ltd. shall either replace or repair the defective part or parts of equipment or replace the equipment or refund the purchase price at Barnett Engineering Ltd.'s option after return of such equipment by buyer to Barnett Engineering Ltd. Shipment to Barnett Engineering Ltd.'s facility shall be borne on account of buyer.

(1) Consequential Damages: Barnett Engineering Ltd. shall not be liable for any incidental or consequential damages incurred as a result of any defect in any equipment sold hereunder and Barnett Engineering Ltd.'s liability is specifically limited to its obligation described herein to repair or replace a defective part or parts covered by this warranty.

(2) Exclusive Warranty: The warranty set forth herein is the only warranty, oral or written, made by Barnett Engineering Ltd. and is in lieu of and replaces all other warranties, expressed or implied, including the warranty of merchantability and the warranty of fitness for particular purpose.